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North Carolina Department of Transportation
Statewide Planning Branch
Small Urban Planning Unit

Thoroughfare Plan

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September, 1995

WILLIAMSTON THOROUGHFARE PLAN

September, 1995

Prepared by the:

Small Urban Planning Unit
Statewide Planning Branch
North Carolina Department of Transportation

In Cooperation with:

The Town of Williamston
The Federal Highway Administration
The U.S. Department of Transportation

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Forrest Robson 9-27-95

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ACKNOWLEDGMENTS

The coordinated efforts of many individuals and government agencies made Williamston's Thoroughfare Plan possible. Williamston's Planning & Zoning Board along with Williamston's Town Council actively participated with the Department of Transportation to enable an effective thoroughfare planning process. By debating and choosing between difficult alternatives, Planning Board and Town Council members helped ensure this thoroughfare plan minimizes predictable community and environmental problems.

The Project Engineer conducted Williamston's thoroughfare planning process and wrote this report. The Thoroughfare Planning Engineer was responsible for providing necessary practical experience to ensure the plan conforms with the Small Urban Unit's objectives. The Statewide Planning Branch Manager was responsible for making sure the thoroughfare plan conformed with Department of Transportation policy.

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1. INTRODUCTION

A town's transportation system is one of the most important factors contributing to the economic and social quality of life in the area. Because municipal transportation systems affect so many people and are very expensive to construct, developing transportation systems requires extensive planning. Policy makers established a "thoroughfare planning process" to guide transportation planning activities.

The primary objective of thoroughfare planning is to provide a transportation system which can progressively develop to meet future travel demands. By developing the street system to keep pace with increasing traffic demands, street capacity can be maximized. Proper planning saves money by eliminating unnecessary improvements and minimizing the amount of land needed for streets. Other thoroughfare planning objectives include:

- reducing transportation related environmental impacts, such as air, water, land, and noise pollution,
- reducing travel and transportation costs,
- reducing the cost of street improvements to the public through the coordination of subdivision and commercial developments with street developments,

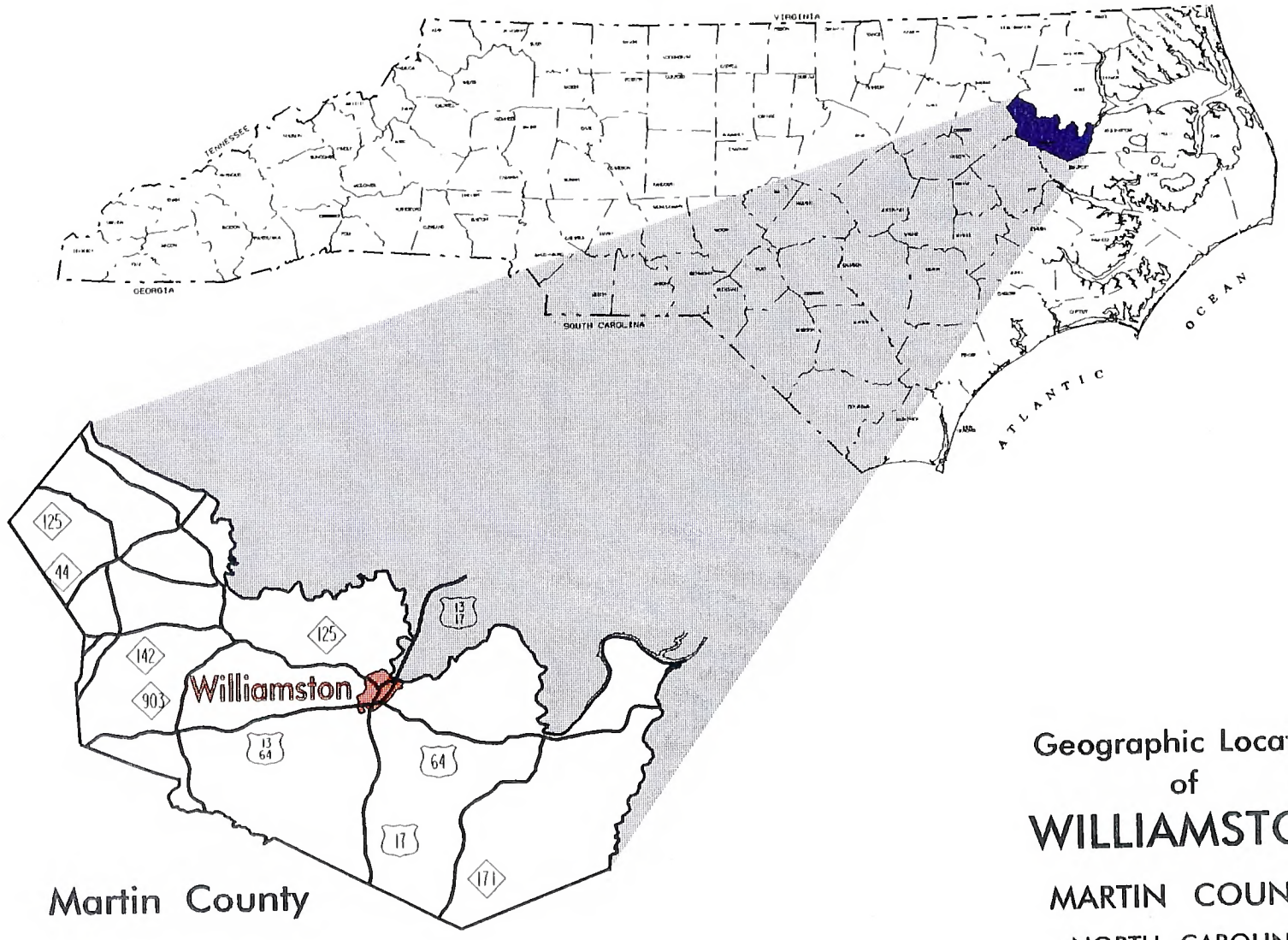
- enabling local citizens to plan their actions with full knowledge of public intent,
- minimizing disruption and displacement of people and businesses through published long range street improvement plans, and
- increasing travel safety.

Williamston, illustrated in figure 1, requested the Department of Transportation for assistance developing a Thoroughfare Plan on May 10, 1993. Williamston's Planning Board and Town Council participated in the thoroughfare planning process. On November 21, 1994, the Williamston Town Council adopted the Williamston Thoroughfare Plan map dated August 23, 1994. Subsequently, the North Carolina Department of Transportation adopted the plan on January 6, 1995.

Williamston's Thoroughfare Plan map is long-range transportation plan which illustrates how the street system will probably be classified in thirty years. This report documents the thoroughfare planning process. After the introduction chapter, there are three chapters of the report:

- Chapter 2 details the Williamston Thoroughfare Plan Recommendations;
- Chapter 3 details the local involvement during the thoroughfare planning process; and
- Chapter 4 details implementation options.

At the end of the report, there are several appendices with additional information on the computer traffic forecasting model and other related items.



Geographic Location
of
WILLIAMSTON
MARTIN COUNTY
NORTH CAROLINA

FIGURE 1

2. RECOMMENDATIONS

Recommendations are based on the thoroughfare planning principles (Appendix A), Williamston's travel deficiency analysis (Appendix B), and a computer traffic model (Appendix C). Figure 2 illustrates the thoroughfare plan mutually adopted by Williamston and the North Carolina Department of Transportation. Additional information on environmental concerns is discussed in Appendix D. Department of Transportation recommendations are tabulated in Appendix E with references to typical thoroughfare cross-sections illustrated in Appendix F.

This chapter discusses thoroughfare plan recommendations in detail. Recommendations are organized by functional classification in two categories, major thoroughfares and minor thoroughfares. The last section of this chapter discusses project benefits.

US HIGHWAYS

US 17, US 64 and Proposed US 13 are major thoroughfares. US 17 and US 64 are designed for high speed traffic movement, and the proposed US 13 will be designed for high speed traffic movement. The proposed US 13 Bypass in conjunction with US 64 is part of the intrastate corridor between Raleigh and the Outer Banks. All three of these

facilities are intended to serve primarily through traffic and not provide direct land access. In North Carolina's 1995-2001 Transportation Improvement Program, the proposed US 13 will be a four-lane freeway on a new location. Construction of this facility is scheduled to begin in 1995.

NC HIGHWAYS

NC 125 is classified as a major thoroughfare. Lined with agricultural, residential, and commercial parcels of land, NC 125 has both traffic flow and land access functions. The thoroughfare plan shows a proposed NC 125 Bypass extending from the existing NC 125 north of town to Prison Camp Road. With a projected 2020 traffic volume of 5,800 vehicles per day, a two-lane shoulder section should handle the traffic sufficiently.

NC 125 through town (Haughton Street and Washington Street), have a projected volume ranging from 9,600 to 15,000 vehicles per day in 2020. Currently, the section of NC 125 from Main Street to Elm Street is a one-way pair. The DOT's recommendation was to extend the one-way pair to operate from Elm Street to Grace Street to relieve projected traffic. However, the Williamston Planning Board and Town Council felt strongly that the existing one-way pair should be converted to two-way traffic. Consequently, to accommodate removing the existing one-way pair, NC 125 from Elm Street to Grace Street should be widened to a five-lane section.

OTHER MAJOR THOROUGHFARES

State Road (SR) 1142, SR 1409, SR 1420, Main Street, and Railroad Street are all listed as major thoroughfares. Although these major thoroughfares serve abutting property, their principle function is to carry traffic. Based on existing traffic volumes, and the minimum recommended lane widths, SR 1409 and SR 1420 should be widened to have 3.3 meter lanes inside Williamston's planning area.

FIGURE 2

LEGEND

	existing	proposed
Major Thoroughfare		
Minor Thoroughfare		
Long Range		
Interchange		
One-Way		

ADOPTED BY:

Williamston November 21, 1994

Dept. of Transportation January 6, 1995

RECOMMENDED BY:

Statewide Planning December 1, 1994

Public Hearing October 24, 1994

THOROUGHFARE PLAN

N

WILLIAMSTON

AND VICINITY

MARTIN AND BERTIE COUNTIES

NORTH CAROLINA

PREPARED BY

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS-STATEWIDE PLANNING BRANCH

IN COOPERATION WITH THE

U.S. DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

0 1000 2000 3000

SCALE IN FEET

0 500 1000

SCALE IN METERS

AUGUST 23, 1994

SR 1420

SR 1409

SR 1142

SR 1124

Proposed US 64

Liberty St

Haughton St

Smithwick St

Pine St

Sycamore St

Elm St

Church St

Main St

Washington St

ROANOKE RIVER

BERTIE COUNTY

MARTIN COUNTY

Railroad Street is also listed as a major thoroughfare. Figure 3 illustrates the proposed Railroad Street project, and the three phases of development.

- Phase 1 - From Sycamore Street to Smithwick Street, the existing narrow roadway should be widened to have 21 meters of right-of-way and two 3.6-meter lanes. Because this section of Railroad Street will be redeveloped for new businesses, the town will probably want enough pavement width to allow for parallel parking along the street.
- Phase 2 - From Main Street to Sycamore Street a two-lane road on new location is proposed.
- Phase 3 - From Smithwick Street to Main Street is shown as a "long range" proposal for a new two-lane facility. The 2020 traffic projections do not show there will be a need to construct this section of Railroad Street by 2020, but this section is a logical extension of the first two sections.

The proposed Railroad Street has two different purposes. Initially, Railroad Street will provide additional redevelopment potential for downtown Williamston. By showing Railroad Street on the thoroughfare plan, local officials will be able to direct redevelopment of the existing property to allow for a major thoroughfare. After phases two and three are complete, Railroad Street can be converted into a one-way pair with Main Street to improve traffic flow throughout the downtown area.

PROJECT BENEFITS

Williamston's Thoroughfare Plan contains three proposed new thoroughfares and one widening project. Each project affects different transportation users, and each project has different costs and benefits. This section of the report quantifies the positive and the negative aspects of each project. The analysis is based on Technical Report #8: Transportation Project Evaluation Using The Benefits Matrix Model published by the Statewide Planning Branch of the Department of Transportation. This analysis provides general information on the relative significance of each project to Williamston's Thoroughfare Plan.

Each project's benefits are determined by comparing the traffic on the existing street network with traffic on the thoroughfare plan network. Table 2-1 shows the results from this analysis on the proposed NC 125 Bypass, the proposed Railroad Street, and the proposed Haughton Street widening. Item one shows the monetized project benefits. Project benefits include vehicle operating cost savings, travel time cost savings, and accident cost savings. Cost savings were calculated by comparing how much existing and future traffic would shift to use the proposed project.

Item two shows the project cost estimates. The cost estimates are based on average cost-per-mile construction information from across North Carolina. Because these cost estimates are not particular to Williamston or to specific roadway design plans, the actual construction costs may be significantly different. The costs listed in the table are useful for illustrating the relative cost difference between alternative projects.

Economic impacts are listed as item three. The probability of economic development enhanced by the project is ranked on a continuous scale from low to high. Projects which have a minimal probability of economic development have a value of zero. Projects which have a high probability of economic development have a value of one.

Environmental impacts are listed as item four. Impacts ranging from very negative to very positive correspond to values ranging from negative one to positive one. Physical environment considerations include: air pollution, water pollution, land pollution, noise pollution, geological resources, wildlife habitats, and natural vegetation. Social environmental considerations include: housing, neighborhoods, schools, churches, parks, public safety, national defense, and aesthetics. Each of these standard environmental factors are ranked and averaged for each project to generate the value listed in the table.

The average daily through trips in the design year are listed as the last item. The number of through trips indicate the significance the project will have on the State Arterial system. Projects which have high volumes of through traffic are more important to the State Arterial system. Projects which have very few through trips are more important to the local street system.

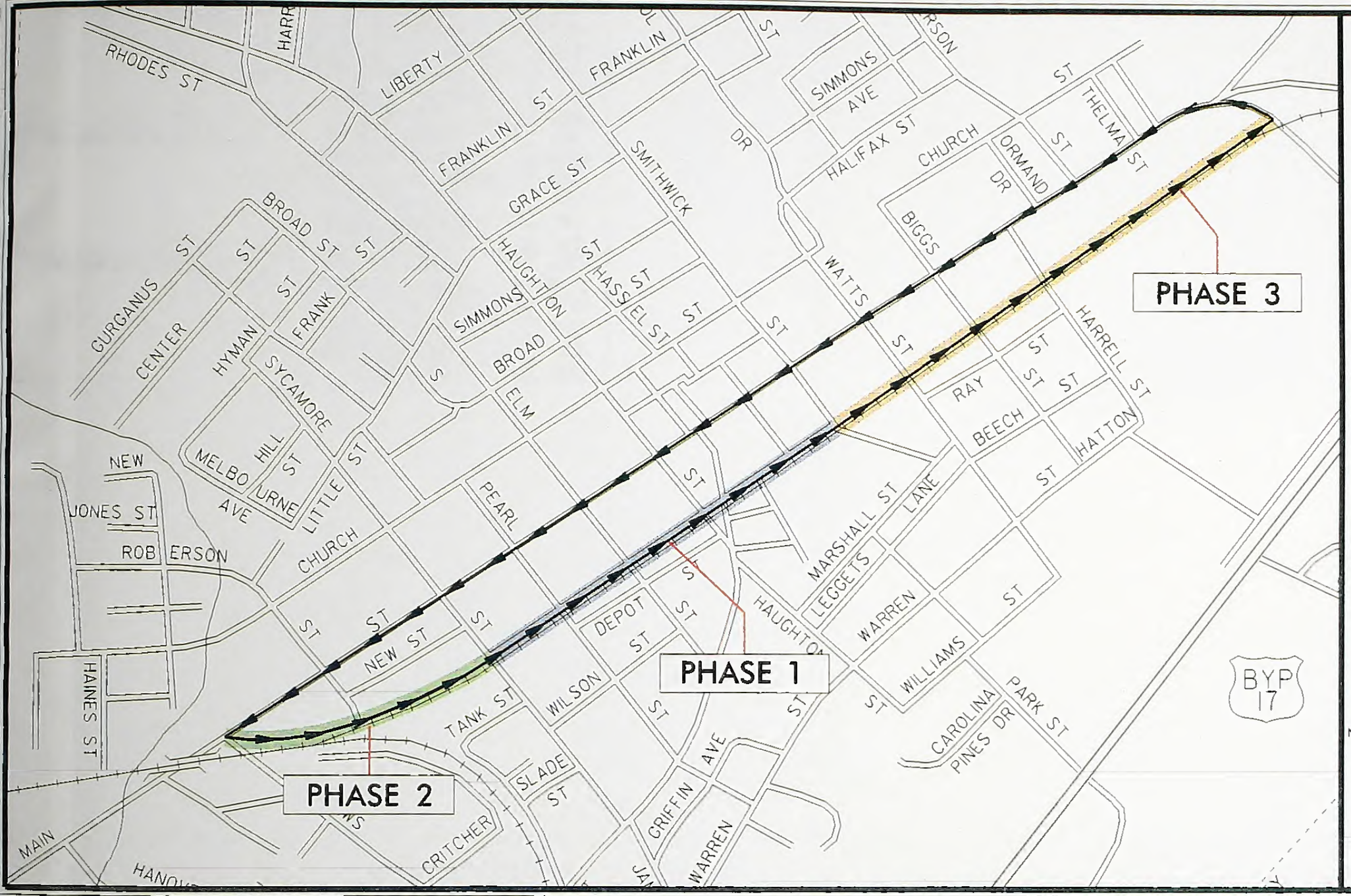


FIGURE 3

LONG RANGE PROPOSAL FOR ONE-WAY PAIR ON RAILROAD AND MAIN ST.

LEGEND

Direction of Traffic

N

DOWNTOWN

WILLIAMSTON

MARTIN COUNTY

NORTH CAROLINA

PREPARED BY

DIVISION OF HIGHWAYS-STATEWIDE PLANNING BRANCH

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

IN COOPERATION WITH THE

U.S. DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

0 1000

scale in feet

0 250

scale in meters

Table 2-1: PROJECT COMPARISON SUMMARY		
Proposed NC 125 Bypass	Benefits (Millions)	$41
	ROW Cost (Millions)	$.09
	Construction Cost (Millions)	$1.88
	Economic Impacts	1.0
	Environmental Impacts	-0.6
	Through Trips	80%
Proposed Railroad Street	Benefits (Millions)	$2
	ROW Cost (Millions)	$0.04
	Construction Cost (Millions)	$0.69
	Economic Impacts	1.0
	Environmental Impacts	-0.2
	Through Trips	10%
Haughton Street Widening	Benefits (Millions)	-$23
	ROW Cost (Millions)	$0.13
	Construction Cost (Millions)	$0.64
	Economic Impacts	0.25
	Environmental Impacts	-0.2
	Through Trips	40%

3. LOCAL INVOLVEMENT

In today's complex democratic society, creating a thoroughfare plan requires working with many different people. Often thoroughfare planning involves: transportation planning engineers, roadway design engineers, community planners, environmental specialists, federal agencies, state agencies, local officials, and local citizens. Williamston's thoroughfare planning process began when Williamston requested the Department of Transportation for assistance updating the 1972 Williamston Thoroughfare Plan.

In August 1993, the Department of Transportation met with Williamston's Town Council and Planning Board. At that meeting, the thoroughfare planning process and the time-line from "thoroughfare planning to road construction" was discussed. In addition, a proposed schedule for Williamston's Thoroughfare Plan was developed.

In February 1994, the Department of Transportation met with Williamston's Planning Board a second time. Population projections, employment projections, dwelling unit projections, and land-use projections were all discussed. By the end of the meeting, everyone came to a consensus for the projections being used in the transportation model.

In May 1994, the Department of Transportation met with Williamston's Planning Board a third time. After a presentation of the computer model development and the associated traffic projections, the projected traffic problems were discussed. Planning

Board members offered ideas for solving the projected traffic problems and requested the DOT to analyze different alternatives with the computer traffic model.

In August, 1994, the Department of Transportation met with Williamston's Planning Board a fourth time. The DOT presented a "preliminary" thoroughfare plan that eliminated the projected traffic problems through the year 2020. The preliminary thoroughfare plan was the same as the thoroughfare plan that Williamston ultimately adopted with one exception - the Haughton Street and Elm Street one-way pair. Williamston's Planning Board felt strongly that Haughton Street and Elm Street should not be a one-way pair, even though Haughton Street would need significant widening if the one-way pair were removed. At the conclusion of the meeting, the Planning Board requested that the DOT remove the Haughton Street / Elm Street one-way pair from the preliminary thoroughfare plan, and make a presentation to the Town Council.

In September, 1994, the Department of Transportation met with Williamston's Town Council. After a general overview of the work completed with Williamston's Planning Board, the Town Council reviewed the preliminary thoroughfare plan. The Town Council supported the Planning Board's recommendations. At the conclusion of the meeting, a Public Hearing was set up for October, 1994.

On October 24, 1994 the Department of Transportation held a public drop-in session and a public hearing on the Williamston Thoroughfare Plan. An public notice published in *The Enterprise* on October 13th and 18th invited the public to review the thoroughfare plan. Only one person came to the public drop-in session, and that same person made the only comment at the public hearing.

On November 21, 1994, the Williamston Commissioners adopted the Williamston Thoroughfare Plan map dated August 23, 1994. Subsequently, the North Carolina Department of Transportation adopted the plan on January 6, 1995.

4. IMPLEMENTATION

Williamston's Thoroughfare Plan is a detailed set of recommendations for how the community should develop a street system to keep up with the area's growth. Because there are no guarantees the area will develop as planned, anticipated traffic growth and future capacity deficiencies may change. Before any of the proposed roads will be considered for construction, a detailed project study will determine if actual development justifies the projects. Environmental studies and roadway design plans will determine specific road alignments.

No one in the Department of Transportation has the job of implementing the recommendations listed in thoroughfare plans because funding is not available for building roads based on predicted need. Local officials are responsible for requesting projects as the need arises. With hundreds of municipalities competing for projects funded by the state's tight budget, Williamston must make well planned requests to be effective. The documented public and political involvement, in addition to technical feasibility, give thoroughfare plan project requests the competitive edge over all other requests.

REGULATIONS

Communities which actively protect their thoroughfare corridors have the best success actually getting projects constructed. Protecting thoroughfare corridors saves

citizens hundreds of thousands and even millions of dollars each year. Thoroughfare Plan adoption, subdivision regulations, future street line ordinances, zoning ordinances, development reviews, and official maps are regulations available to protect thoroughfare corridors.

Thoroughfare Plan Adoption

Section 136-66.2 of the North Carolina General Statutes provides guidelines for adopting a thoroughfare plan. After the municipality and the Department of Transportation cooperatively develop a thoroughfare plan, the plan may be adopted by the municipality and the Department of Transportation. Subsequently, the thoroughfare plan serves as the basis for future street and highway improvements.

The Williamston Thoroughfare Plan should be reviewed locally at least once a year. When significant changes are necessary, the municipality should request the Statewide Planning Branch of the Department of Transportation to update the thoroughfare plan. Depending on actual growth patterns, the plan should be formally updated once every five to ten years.

Subdivision Regulations

Subdivision regulations specify roadway width, right-of-way, and sight distances in new subdivisions. The Department of Transportation manual Subdivision Roads: Minimum Construction Standards documents the design, construction, and utility placement standards necessary for state maintained roads. Regulations are classified by road functions (local street, collector street, etc.). Appendix G contains an example subdivision ordinance. These regulations minimize roadway safety hazards and maintenance costs. Municipalities must have developers construct roads to North Carolina subdivision road standards for the North Carolina Department of Transportation to accept and maintain the road. Roads not meeting state regulations must be constructed and maintained by local or private funding.

Williamston's proposed thoroughfares depend on local officials actively using subdivision regulations. When a proposed subdivision conflicts with the thoroughfare plan, the municipalities should protect the transportation corridor. During the planning stage, the conflicting subdivision roads can be realigned and improved to match the thoroughfare plan. Developers who construct thoroughfare plan streets can benefit from local or state agency coordination. Developers who do not help build the thoroughfare plan improvements should dedicate the necessary road right-of-way. As a minimum, developers should reserve property needed for future road right-of-way.

Future Street Line Ordinances

Typically, by the time an existing road needs widening, houses and buildings line both sides of the road with no room to spare. Residents are understandably upset when widening the road swallows their entire yard, or worse their whole house. Businesses are equally upset when widening the road eliminates their only customer parking spaces, or their entire office. Building setbacks based on the thoroughfare plan recommendations reduce this problem.

As time passes, existing buildings age; some are renovated, others are replaced with newer buildings. Simultaneously, new buildings fill in the land between established buildings as zoning density limits increase. With adequate setback requirements, all the buildings constructed or renovated after thoroughfare plan adoption can have space for road widening. Ultimately, when the road is widened, fewer property owners will be negatively affected.

Zoning Ordinances

Zoning is a legal device available for implementing a land use plan. Most legislation today is based on the U.S. Department of Commerce 1924 Standard Zoning Enabling Act. Zoning involves dividing a municipality into districts and regulating each district's population density, land use, open space, and other local concerns. Although zoning ordinances do not regulate street design or right-of-way, zoning directly influences

transportation by protecting thoroughfare corridors and controlling transportation demand.

Zoning can control transportation demand by discouraging strip development zones along highways which create inefficient traffic flows. Isolated, single purpose businesses connected by highways congest the roads with people driving from one place to another for everyday activities. Driving to the grocery store for a loaf of bread and then driving to the post office to buy a roll of stamps often takes more driving time than shopping time. Zoning business areas for campus developments instead of strip development reduces automobile traffic by eliminating unnecessary automobile trips.

Zoning can also reduce automobile traffic by encouraging walking or bicycling. Just as shopping malls encourage people to walk from one shop to another, other developments can encourage people to walk from one business to another. Sidewalks should connect office complexes with lunch time eating and shopping areas. Neighborhoods, schools, libraries, and parks should also have connecting sidewalks and bicycle paths so people can choose their travel mode. Appendix H is a copy of the DOT Pedestrian Policy Guidelines.

Development Reviews

Development reviews save developers and municipalities the headache of dealing with avoidable transportation related problems. Reviews done at an early stage often save developers and municipalities money and increase the site's accessibility. Depending on how the development will affect existing and future traffic, different Department of Transportation specialists review the development plans.

Since the developers usually contact the municipality first, the municipality should advise them to contact the District Engineer. The District Engineer reviews all requests for driveway access to State maintained roads. If necessary, the District Engineer will forward development requests to other Department of Transportation branches. If requested, the Statewide Planning Branch reviews all development requests on or near proposed thoroughfares and all requests which may prevent existing thoroughfares from

being widened in the future. The Traffic Engineering and Highway Design Branches review large traffic generating developments like shopping centers, large industries, and fast food restaurants. The District Engineer can be contacted by writing:

District Engineer
N.C. Department of Transportation
P.O. Box 928
Plymouth, NC 27962

Official Maps

The North Carolina Statutes 136-44.50 through 136-44.53 are collectively designated as the "Roadway Corridor Official Map Act." This act gives state and municipal governments the power to protect transportation corridors based on official corridor maps. The official map which details the proposed thoroughfare alignment, the functional design, and the preliminary right-of-way boundaries is filed with the municipality Register of Deeds.

Roadway corridor maps may be adopted by the Department of Transportation or the municipality. The Department of Transportation makes official corridor maps only for fully controlled access facilities outside municipal jurisdiction. Municipalities must make official corridor maps for facilities without fully controlled access or facilities inside municipal jurisdictions. County Commissioners must approve municipal official corridor maps that extend beyond the municipality's extraterritorial jurisdiction.

Municipalities protect road corridors by prohibiting building permits or subdivision approvals on property within the corridor alignment. Because this places severe restrictions on private property rights, land owners are sometimes compensated by having a reduced tax rate on any undeveloped or unsubdivided land within the transportation corridor.

Awkward legislation makes official corridor maps ineffective or inappropriate for most road corridors. Unless an environmental impact study or preliminary engineering

study begins within one year of the official corridor map recording, the official map becomes legally void. If the environmental impact process is initiated, property restrictions only last up to three years, beginning when the developer requests permit or subdivision approval. Even if all other criteria are met, if federal funds are used, the environmental impact process chooses the road corridor with the least environmental damage, not necessarily the official map corridor.

The document Guidelines for Municipalities Considering Adoption of Roadway Corridor Official Maps has more details. Request this document from:

Program and Policy Branch
N.C. Department of Transportation
P.O. Box 25201
Raleigh, North Carolina 27611.

The Program and Policy Branch of the North Carolina Department of Transportation is responsible for coordinating Official Corridor Maps.

Regulation Coordination

Individually, thoroughfare plan adoption, subdivision regulations, zoning ordinances, development reviews, and official maps are all useful regulation tools. However, these regulations should be coordinated together to enhance their total effectiveness. Although each regulation applies to different items, each regulation can support other regulations. Table 4-1 lists the regulations which should be coordinated for each thoroughfare plan project. Municipalities with coordinated regulations can transfer severable development rights as bargaining chips to attract and influence development in the community's best interest.

Table 4-1: PROJECT COORDINATION					
Project	Thoroughfare Plan	Subdivision Ordinance	Future Street Line Ordinance	Zoning Ordinance	Development Review
Proposed NC 125 Bypass	X	X		X	X
Proposed Railroad Street	X		X	X	X
Haughton Street Widening	X		X	X	X

FUNDING

Almost every city, town, and village from the mountains to the coast would like some type of road improvements. Each year communities request funding for everything from new Interstates to bicycle paths. Right-of-way costs consume up to half of the total project costs. When municipalities can actively protect transportation corridors, reduce right-of-way costs and save North Carolina tax payers millions of dollars, Board of Transportation members notice.

State and Federal Funding

The Department of Transportation, Division of Highways, is responsible for all state maintained roads outside municipal corporate limits. Inside municipal corporate limits, the Division of Highways is responsible for major streets and highways which carry primarily through traffic and traffic to major commercial, industrial, or governmental destinations. Division of Highways funds for the construction, maintenance, and improvements to the state road system can help implement thoroughfare plan recommendations.

North Carolina's Transportation Improvement Program (TIP) is a document which lists all major construction projects the Department of Transportation plans for the next

seven years. Similar to local Capital Improvement Program projects, TIP projects are matched with projected funding sources. Each year when the TIP is updated, completed projects are removed, programmed projects are advanced, and new projects are added (typically during the seventh year).

During annual TIP public hearings, counties and municipalities request projects to be put in the TIP. A Board of Transportation member reviews all of the project requests in a particular area of the state. Based on the technical feasibility, need, and available funding, the board member decides which projects will be included in the TIP. In addition to highway construction and widening, TIP funds are available for bridge replacement projects, highway safety projects, public transit projects, railroad projects, bicycle projects, and pedestrian projects.

Non-TIP funds are also available for special purposes. The Department of Transportation has separate funds for paving secondary roads, building industrial access roads, and miscellaneous spot improvements in small urban areas. To find out if any of these funds are available, contact the Board of Transportation member for Division 1, or the DOT Division Engineer for Division 1. The Federal Government provides useful block grants such as urban renewal grants and demonstration project funding. Table 4-2 lists possible funding sources for implementing particular projects. Used in coordination with thoroughfare planning, these other funding sources can make significant transportation improvements.

Table 4-2: PROJECT FUNDING SOURCES

Project	Local Funds	TIP Funds	Secondary Road Funds	Industrial Access Funds	Small Urban Spot Improvement
Prop. NC 125 Bypass		X			
Proposed Railroad Street	X	X			
Haughton Street Widening		X			

APPENDIXES

Appendix A: THOROUGHFARE PLANNING PRINCIPLES

Through time, villages grow into towns, towns grow into small cities, and small cities grow into large cities. All communities are dynamic places, constantly changing to keep pace with the increasing demands of today's citizens. Older buildings are replaced with newer more efficient structures. Agricultural land is converted to residential or commercial land. Low density zones are raised to high density zones to allow more people to use smaller parcels of land.

Only the roads remain much the same today as they were when they were originally built. True, today's engineered asphalt and concrete roads are far more efficient than the horse and buggy trails of yesterday. But, often the old horse and buggy trail alignment is the only alignment available for new highways. Once communities establish development patterns based on the existing roads, improving the alignment of the roads is difficult and sometimes impossible. Even after General Sherman burned Atlanta to the ground during the American Civil War, the city was still rebuilt using the original road corridors. Since the street system is permanent and expensive to build, policy makers established thoroughfare planning principles to guide transportation planning.

OBJECTIVES

The primary objective of thoroughfare planning is to provide a transportation system which can progressively develop to meet future travel demands. By developing the urban street system to keep pace with increasing traffic demands, street capacity can be maximized. Proper planning saves money by eliminating unnecessary improvements and minimizing the amount of land needed for streets.

Other thoroughfare planning objectives include:

- reducing transportation related environmental impacts, such as air, water, land, and noise pollution,
- reducing travel and transportation costs,

- reducing the cost of street improvements to the public through the coordination of subdivision and commercial developments with street developments,
- enabling local citizens to plan their actions with full knowledge of public intent,
- minimizing disruption and displacement of people and businesses through published long range street improvement plans, and
- increasing travel safety.

Thoroughfare planning objectives are achieved by improving the "operational efficiency" and the "system efficiency" of the street system. Improving the operational efficiency means increasing street capacity. Improving system efficiency means coordinating all the streets to support each other.

OPERATIONAL EFFICIENCY

A street's operational efficiency is the ability of the street to carry vehicles and people. A street's traffic capacity is the maximum number of vehicles which can pass a given location during a given time under the existing traffic conditions. Capacity is affected by the physical features of the roadway, nature of traffic, and weather. Three ways to improve street capacity are: physical roadway improvements, traffic flow management, and travel demand management.

Although physical road improvements are typically the first method people think of to increase capacity, physical improvements are very expensive and often politically controversial. Physical road improvements include: adding lanes, modifying intersections, improving vertical alignment, improving horizontal alignment, and eliminating roadside obstacles. By reducing the impedances to the main traffic flow caused by slow moving or turning vehicles, these improvements can significantly increase street capacity.

Traffic flow management improvements are another effective method for increasing street capacity. Although the political controversy can still be significant, traffic flow management generally costs less than physical road improvements. Traffic flow management improvements include:

- Controlling land access—A roadway with complete access control can often carry three times the traffic handled by a non-controlled access street with the same number of lanes.
- Removing parking—By removing parking, additional street width is available for traffic. The additional width can make another traffic lane or simply reduce traffic friction caused by parking vehicles.
- One-way operation—One-way streets can handle 20-50 percent more vehicles than two-way streets with the same number of lanes. One-way streets also improve traffic flow by decreasing potential traffic accidents and increasing intersection capacity.
- Minimizing traffic signals—Each traffic signal reduces the amount of time available for traffic to travel straight through an intersection.
- Spacing and coordinating traffic signals—A coordinated series of traffic signals minimizes the excessive stop-and-go operation common with closely spaced signalized intersections. With adequate spacing, coordinated signals increase street capacity by enabling traffic to flow at more uniform speeds.

Increasing concern over the world's diminishing natural resources is causing people to oppose highway improvements which take additional land and increase the total number of vehicles on the roads. Travel demand management increases street capacity by changing people's travel patterns, without building new roads and without significantly increasing environmental damage. The following policies are part of travel demand management:

- Encourage people to form carpools and vanpools. Increasing the number of people in each vehicle reduces the number of vehicles on the road and increases the people carrying capacity of the street system.
- Encourage people to walk. Williamston's pleasant community atmosphere and nice climate make walking fun, easy, and safe. Getting people out of their cars

and on to the sidewalks changes auto-oriented business areas into friendly people-oriented community areas.

- Encourage people to ride bicycles. Every person who rides a bicycle instead of driving removes one car from the street network. In addition, bicycle riding does not create environmentally harmful automobile exhaust.
- Encourage industries, businesses, and institutions to stagger work hours or establish variable work hours for employees. Variable work hours spread the morning and afternoon peak travel over a longer time and increase the street's daily traffic capacity.
- Encourage land use development in a more pedestrian oriented manner. Avoid imprisoning citizens to automobiles for daily necessities. Allow citizens to choose whether to drive or not by providing appropriate sidewalks and bicycle facilities.

SYSTEM EFFICIENCY

Any system is only as good as each of its parts. For example, an automobile - no matter how expensive, no matter how powerful, or how high the speedometer scale - if one tire is flat, the car will not go fast. Street networks operate the same way. If one important link is missing, the whole network is burdened with unnecessary traffic. Every street has a particular functional classification which is important to the entire street system. An efficient system reduces travel distances, travel time, and travel costs.

Urban Functional Classification

Streets have two primary functions, traffic service and land access. Traffic service involves moving many high speed vehicles; land access involves slow moving vehicles turning into driveways. Combining slow turning vehicles with high speed traffic creates significant conflicts. The conflicts are not serious if both traffic service and land access demands are low. However, when traffic volumes increase, conflicts cause intolerable traffic congestion and serious safety hazards. Urban thoroughfare plans designate a

functional system of streets which minimizes these problems. Streets are categorized as local access streets, minor thoroughfares, or major thoroughfares.

Local access streets provide access to abutting property. Depending on the land use, local streets may be subclassified as residential, commercial, or industrial. Local streets should not carry heavy volumes of traffic, and by design, they should discourage unnecessary traffic.

Minor thoroughfares connect local access streets to the major thoroughfares. They provide some access to abutting property, but they should be protected enough to allow a safe traffic flow to the major thoroughfares. Designing minor thoroughfares to serve limited areas protects them from excessive traffic.

Major thoroughfares are the primary traffic arteries of the town. Although they may serve abutting property, their principle function is to carry large volumes of traffic. Uncontrolled strip development significantly lowers their capacity because each driveway impedes the traffic flow. Similarly, on-street parking should be avoided because it also impedes the traffic flow.

Ideal Small Urban Thoroughfare System

An ideal thoroughfare system coordinates local streets, minor thoroughfares, and major thoroughfares into a radial-loop pattern. The radial-loop arrangement provides direct access between all municipal areas. Figure A-1 shows how radial streets, cross-town streets, loop streets, and bypasses work together.

Similar to the spokes on a bicycle tire, radial streets run from outside the planning area to inside the planning area. Radial streets are major thoroughfares which provide traffic movement between points located on the outskirts of the city and the central area. This major traffic movement provides economic strength in the central business district. Cross-town streets and a loop around the central business district prevent the traffic congestion caused by all the radial streets converging at one location. Cross-town streets provide convenient access to the local businesses and merchants. Traffic destined for downtown can circle on the loop, and then enter downtown near its destination. Local

traffic not destined for downtown can drive around the loop. This cross-town system removes unnecessary traffic from the downtown and enhances the business and shopping atmosphere.

Loop streets connect suburban areas together. As people and businesses move away from the central business areas to the suburbs for cheaper land and lower taxes, many commuters drive from one suburb to another, without stopping downtown. The outer loop moves traffic between suburban areas avoiding the downtown altogether. Depending on the size of the urban area, more loops may be necessary; they should be spaced one-half mile to one mile apart.

A bypass carries through traffic around the urban area and removes it from the city street system. Bypasses are designed with controlled access to move through traffic quickly, not to access property. Occasionally, a bypass can function as a portion of an urban loop. By freeing the local streets for shopping and home-to-work traffic, bypasses typically increase the economic vitality of the local area.

PRACTICAL APPLICATIONS

The ideal "radial-loop urban thoroughfare system" and the ideal "rural functional classification system" are a great goal, but are often not 100% attainable. In practice, all areas have natural constraints which complicate the thoroughfare planning process. These constraints include: existing land uses, existing streets, existing developments, public attitudes, local politics, and future development projections. During the thoroughfare planning process, a transportation engineer analyzes the critical constraints to determine the best mix of existing and proposed roads.

IDEAL SMALL URBAN THOROUGHFARE PLAN

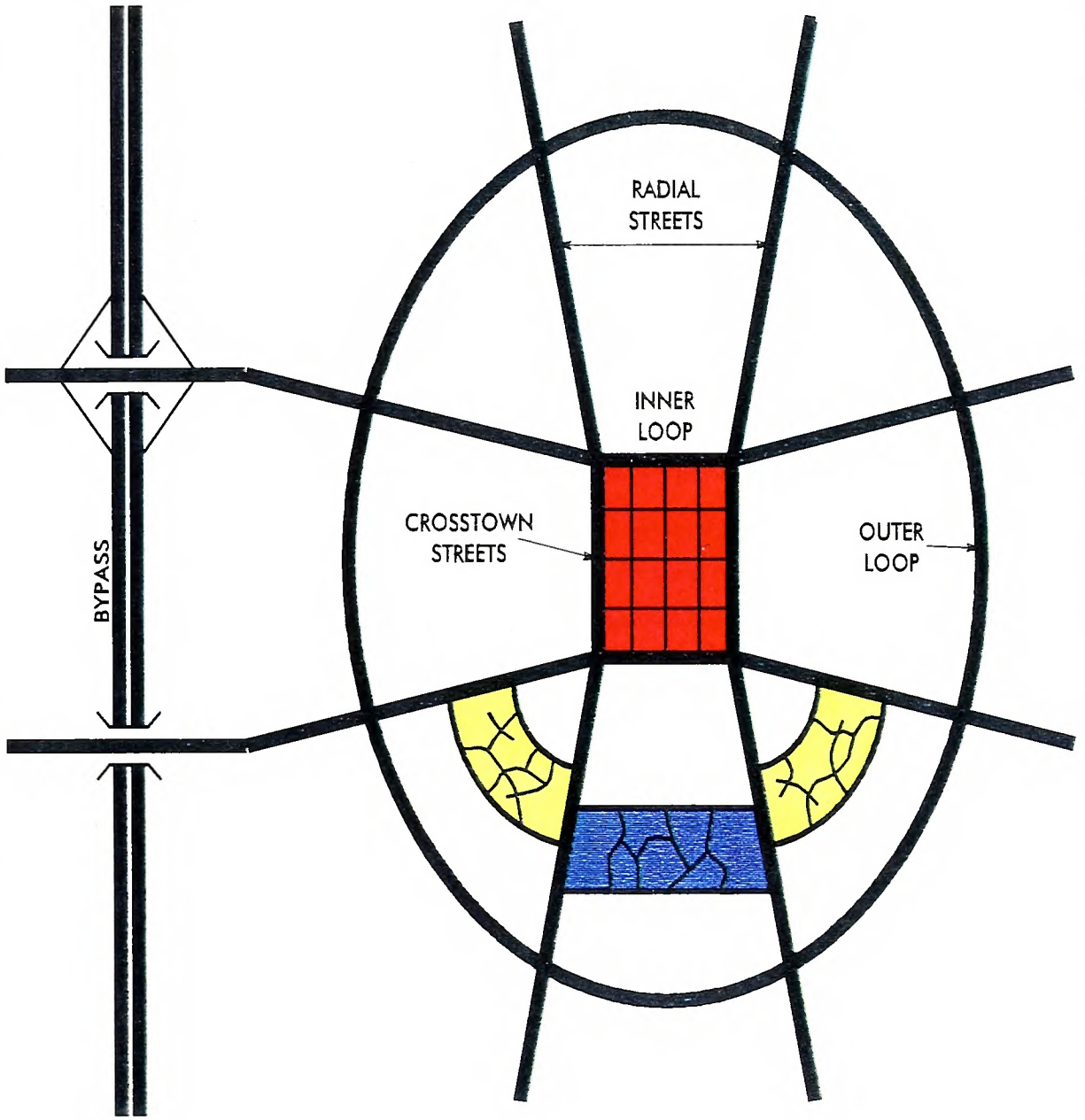


Figure A–1

Appendix B: TRAVEL DEFICIENCY ANALYSIS

The North Carolina Department of Transportation and the Town of Williamston have invested valuable time and money in Williamston's street system over the past century. Development patterns along the streets in the local areas have established a unique community character. Developing a thoroughfare plan requires detailed information on this local character and other existing local conditions. Existing roads, population trends, traffic accidents, travel demand, and street capacity are all used for evaluating travel deficiencies.

EXISTING ROADS

Three US routes and one NC route serve Williamston by providing direct access to the entire Intra-state Highway Network. US 64 extends from the western tip of NC in the Appalachian Mountains to the Atlantic ocean. US 17 follows the coastal plain extending from South Carolina to Virginia. US 13 connects Williamston to communities like Greenville and Goldsboro. Lined with agricultural, residential, and commercial parcels of land, NC 125 has both traffic flow and land access functions. Parts of NC 125, have such a high aesthetic quality, it is part of the North Carolina Scenic Byway *Tarheel Trace.* Figure B-1 illustrates the existing roads in Williamston.

POPULATION TRENDS

Population directly relates to automobile traffic in three different ways. First, the number of automobiles owned and driven in the planning area increases as the population increases. Second, the number of people driving into the planning area increases as the number of businesses in the planning area increases. Third, the number of trips passing through the planning area increases as the population of surrounding communities increases.

Based on information obtained form the North Carolina State Data Center, North Carolina is projected to grow at an average rate of 0.9% per year. Figure B-2 illustrates North Carolina's population trends and projections. Also based on North Carolina State Data Center, Martin County's population is projected to decrease over the next 20 years. Contrarily, the 1992 State Profile published by Wood & Poole Economics projects Martin County's population to grow at a modest 0.3% per year. Figure B-3 illustrates the two different population projections for Martin County. Because the 0.3% population growth rate is more "conservative" for thoroughfare planning purposes, traffic projections are based on the population growth of 0.3% per year.

Based on information obtained from the North Carolina State Data Center, figure B-4 illustrates Williamston's population ranging from 5,500 - 6,300 over the past eight years. Because the thoroughfare planning area extends beyond the existing town limits, Williamston's planning area population is greater than the municipal population. Figure B-5 illustrates the planning area population projections.

TRAFFIC ACCIDENTS

Traffic accidents cost all insured North Carolina citizens hundreds of dollars each year in automobile insurance premiums. Traffic accidents are attributed to three general causes: driver characteristics, vehicle characteristics, and environmental characteristics. Driver characteristics include driving ability, mental alertness, and reaction time. Vehicle characteristics include vehicle type, vehicle condition, and vehicle responsiveness. Environmental characteristics include road conditions, weather conditions, physical obstructions, and traffic conditions.

All traffic accidents listed in the Division of Motor Vehicles' files from January 1988 through December 1993 inside Williamston were reviewed. Table B-1 lists all intersections with fifteen or more accidents during the past six years and Figure B-6 illustrates the most frequent accident locations. In general, the highest number of accidents occurs along the existing US 13/64 Bypass corridor. The accident rate along this corridor should reduce when the new US 64 Bypass is constructed.

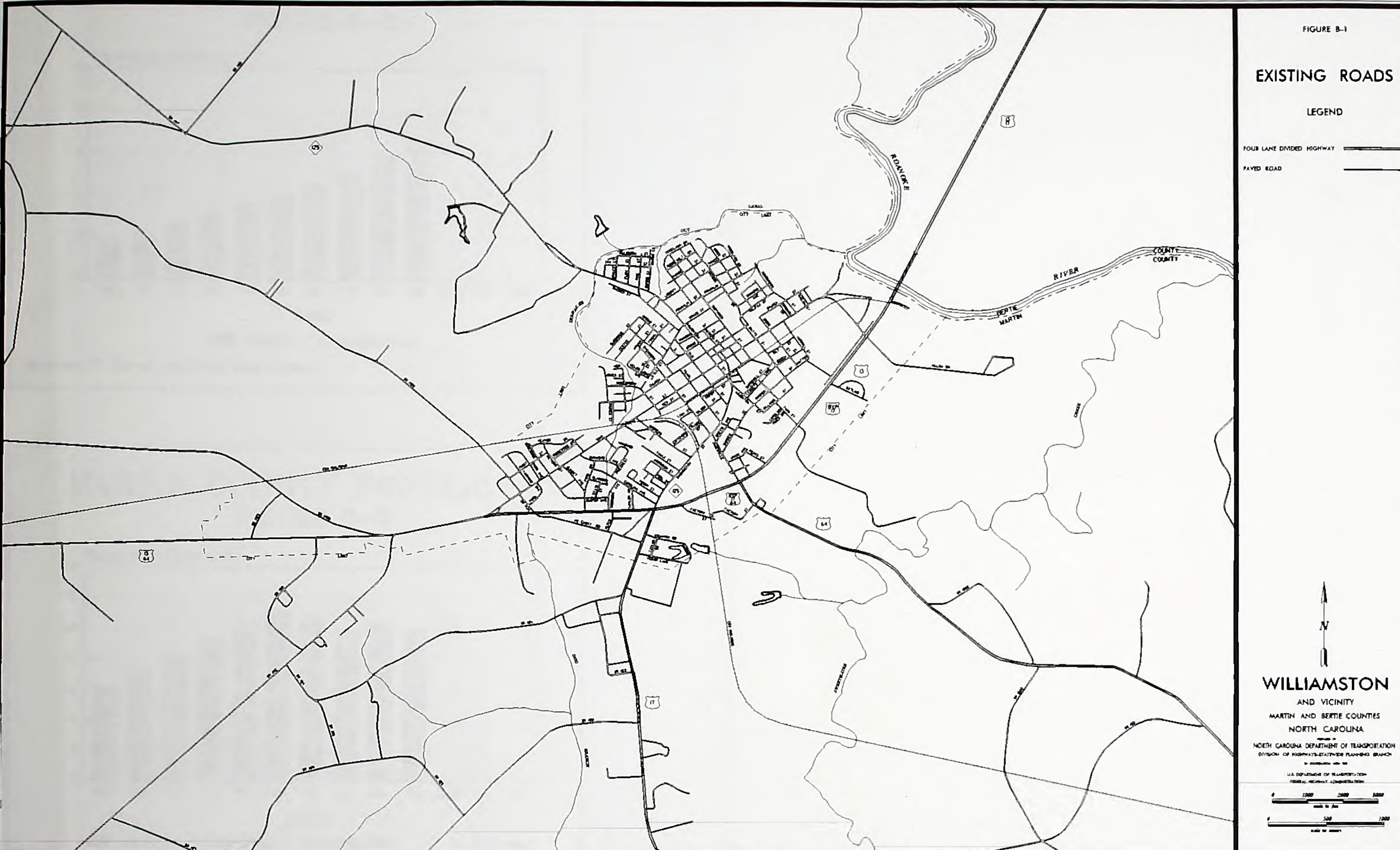
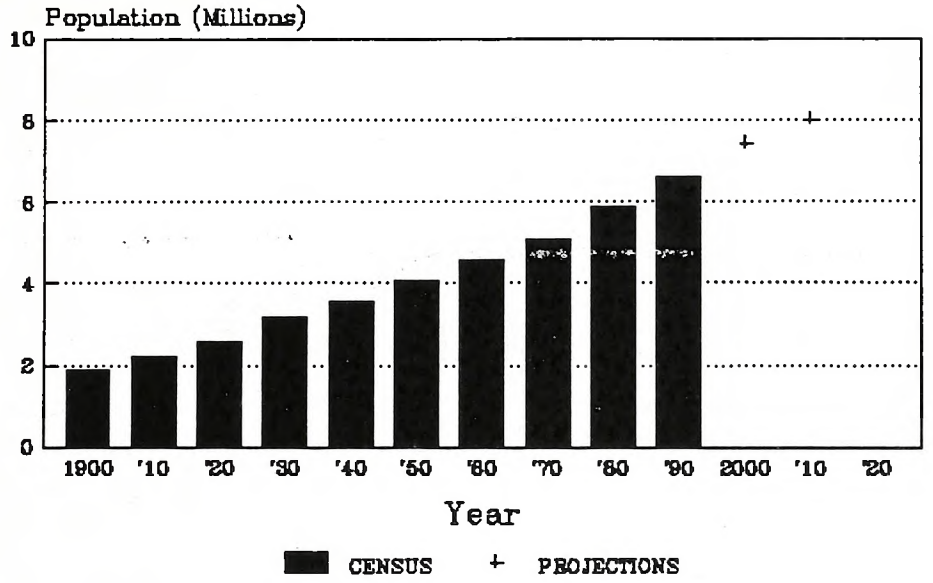


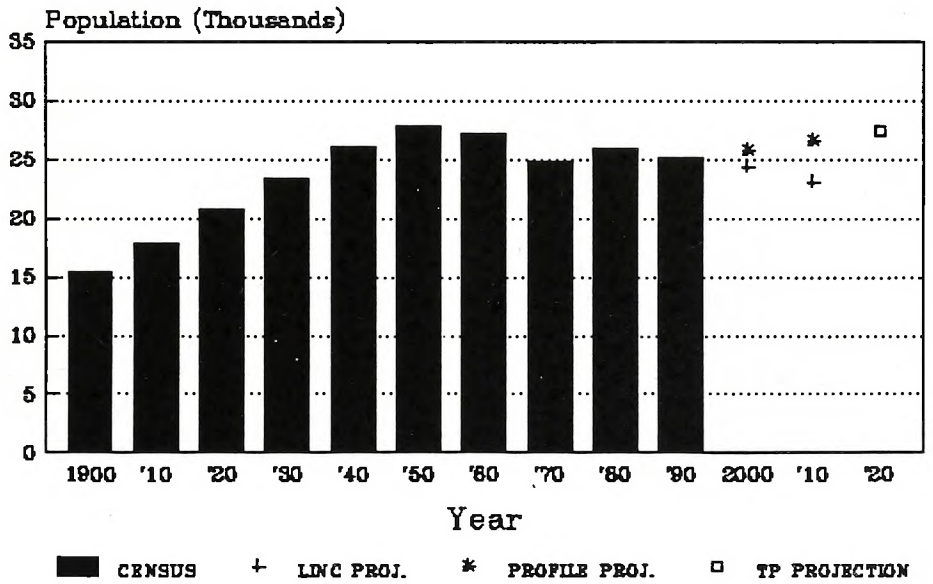
FIGURE B-1
EXISTING ROADS
LEGEND
FOUR LANE DIVIDED HIGHWAY
PAVED ROAD
ROANOKE
RIVER
BERTIE
MARTIN
COUNTY
COUNTY
CANAL
CITY
LIMIT
CREEK
N
WILLIAMSTON
AND VICINITY
MARTIN AND BERTIE COUNTIES
NORTH CAROLINA
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

NC POPULATION TRENDS
FIGURE B–2



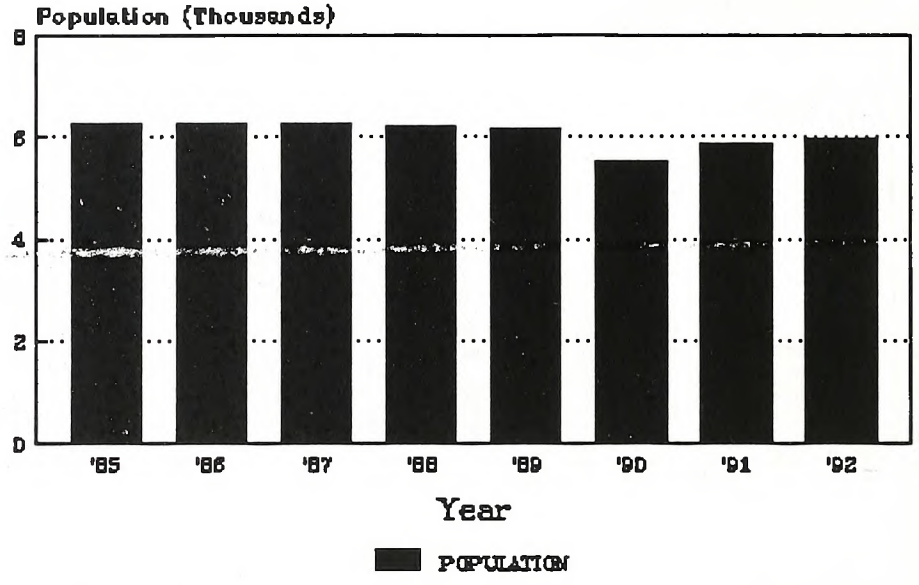
Sources: US Census and State Data Center

MARTIN COUNTY POPULATION
FIGURE B–3



Sources: US Census, LINC, State Profile

WILLIAMSTON POPULATION
FIGURE B-4



Source: NC State Data Center

PLANNING AREA POPULATION
FIGURE B-5

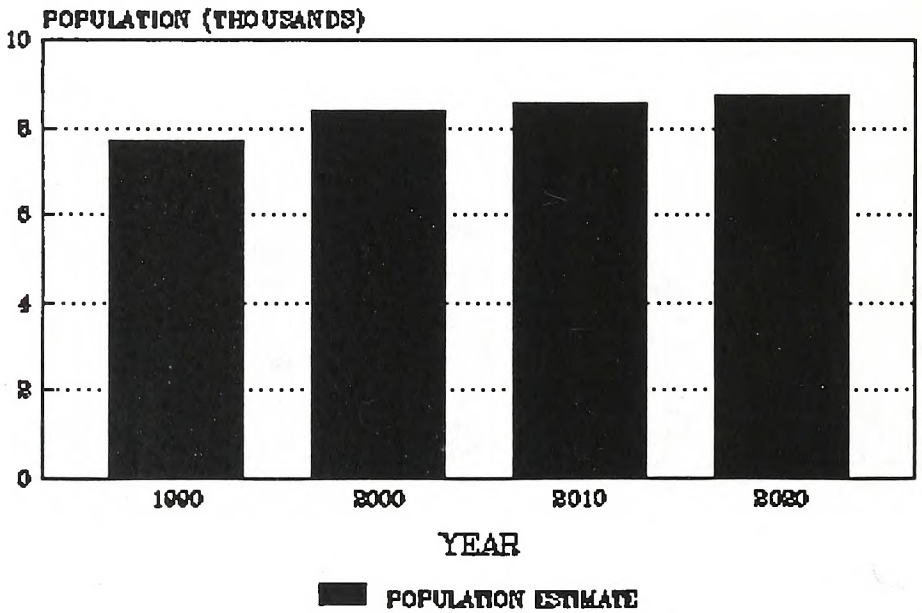


FIGURE B–6

HIGH ACCIDENT LOCATIONS
1988 – 1993
15 ACCIDENT MINIMUM

LEGEND

> 20 ACCIDENTS

> 15 BUT < 20 ACCIDENTS

WILLIAMSTON

AND VICINITY

MARTIN AND BERTIE COUNTIES

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0 1000 2000 3000

scale in feet

0 500 1000

scale in meters

Table B-1: WILLIAMSTON ACCIDENT INVENTORY	
Intersections with 10 or more accidents from January 1988 through December 1993	
LOCATION	NUMBER OF ACCIDENTS
Jamesville St. - Washington St.	23
Main St. - Robeson St.	11
Washington St. - Pearl St.	13
Main St. - Watts St.	14
Main St. - Sycamore St.	14
Main St. - Smithwick St.	13
Haughton St. - Railroad St.	11
Haughton St. - Main St.	17
Haughton St. - Liberty St.	11
Elm St. - Washington St.	19
Elm St. - Railroad St.	16
Elm St. - Main St.	15
Church St. - Sycamore St.	10
Church St. - Haughton St.	14
Andrews St. - Washington St.	16
US 13 - US 64	61
US 13 - US 17	84
US 13 - Willow Dr.	10
US 13 - Park St.	31
US 13 - Main St.	20
US 13 - Gatling St.	20
US 64 - SR 1500	10
US 17 - SR 1001	21

TRAVEL DEMAND

Have you ever traveled on a busy Interstate and wondered where all the other thousands of cars were going? Travel demand is the technical term for analyzing this question. The name comes from the concept of people wanting to "travel" and "demanding" the road adequately handle all the traffic. Existing travel demand is reported as average daily traffic (ADT). Average daily traffic is the average amount of traffic which passes a particular point on the road in a typical day.

BRIDGES

Bridges are a significant part of all highway networks. In Williamston, there are 3 bridges. Because bridges are so expensive to build and because they require such extensive engineering design, bridges need to be planned long before they are critical links. The North Carolina Department of Transportation inspects all bridges on the State Highway System and rates each bridge according to specific attributes. Bridge sufficiency ratings range from 0 to 100, with 100 being the best. Low sufficiency ratings do not mean bridges are unsafe, ratings simply compare all bridges relative to an ideal design and safety standard. Table B-2 lists all bridges in Williamston along with the corresponding "sufficiency rating" and figure B-5 illustrates their locations.

Table B-2: WILLIAMSTON BRIDGES

Bridge #	Rating
1	82.7
7	68.6
R234	NA

CAPACITY ANALYSIS

The maximum number of vehicles that can drive on a street at the same time is called the street's traffic capacity. Unlike the definite "capacity" of a glass holding water, the "capacity" of a street includes a variable element based on driver acceptance. People will not accept bumper-to-bumper traffic 24 hours a day, but they will accept bumper-to-bumper traffic for a short time. People accept different street capacities based on expected "level of service." Figure B-8 illustrates the traffic conditions for six typical levels of service:

1. Level-of-service "A" describes free flow operations. People can choose a desirable speed and maneuver easily in the traffic stream.
2. Level-of-service "B" describes almost free flowing operations. People can drive at posted speeds and are only slightly restricted maneuvering in the traffic stream.

FIGURE B–7

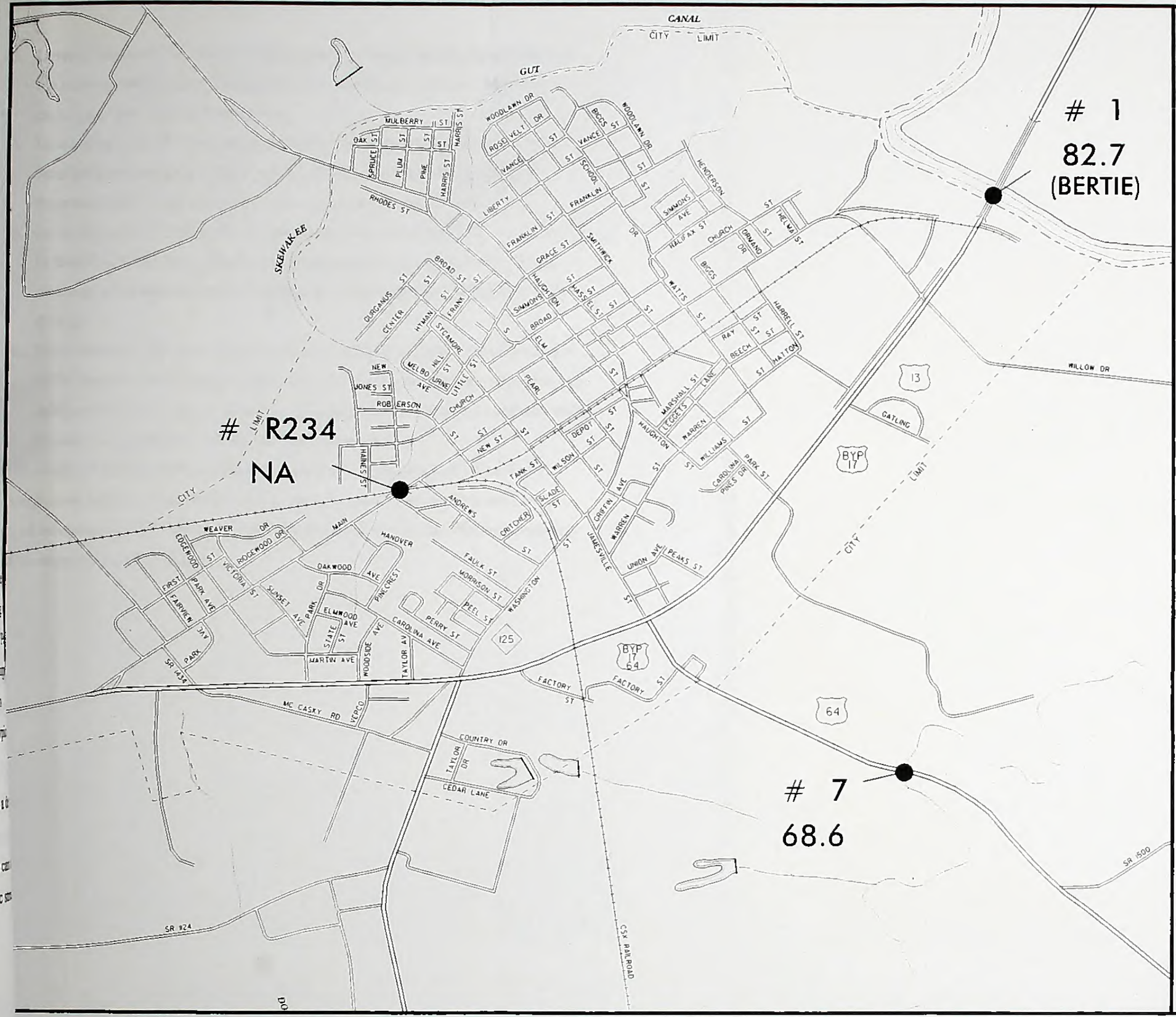
WILLIAMSTON BRIDGES

LEGEND

Bridge Location ●

Bridge Number # 1

& Rating 0.00



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0 1000 2000 3000

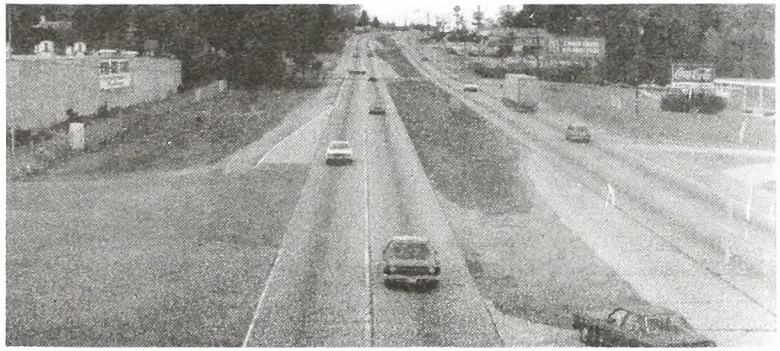
scale in feet

0 500 1000

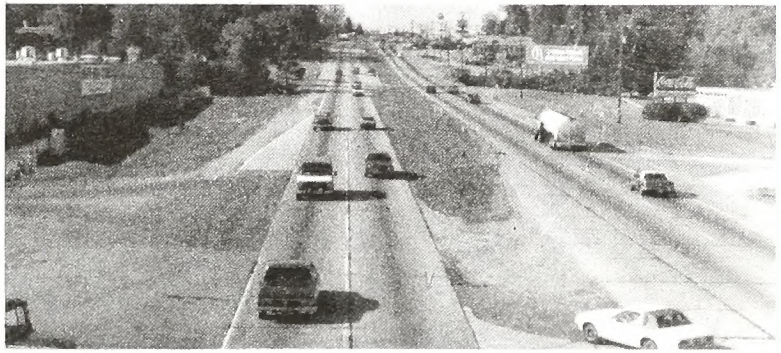
scale in meters

3. Level-of-service "C" describes stable operations. Many vehicles have to drive at the same speed because of moderately restricted maneuverability. Motorists experience some tension from driving.
4. Level-of-service "D" describes acceptable congestion during rush hour. Most vehicles have to drive slightly below the posted speed because of restricted maneuverability. Motorists experience noticeable driving tension.
5. Level-of-service "E" describes congested rush hour conditions. All vehicles have to drive below the posted speed because maneuvering is very difficult. Tense motorists often become annoyed waiting at traffic signals and feel fatigued after driving.
6. Level-of-service "F" describes a traffic jam. Vehicles are subject to stop-and-go traffic because maneuvering is seemingly impossible. Intersection congestion and delays are common. Tense motorists, annoyed at traffic signals and irritated with the other "incompetent" drivers, feel angry after driving.

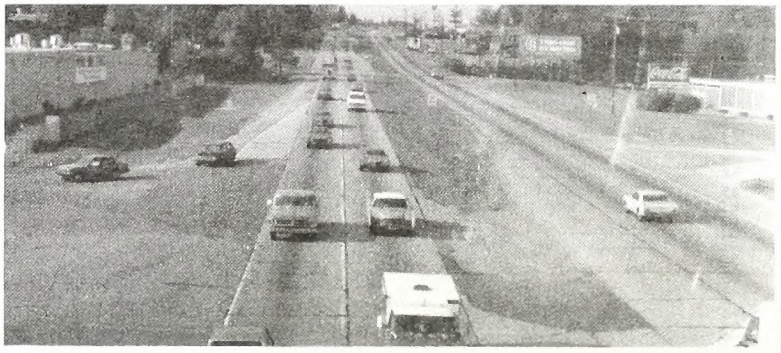
The thoroughfare plan recommendations are based on a minimum level-of-service D. Although most people prefer a better level of service, level-of-service D is the highest level of service people are willing to fund. Figure B-9 illustrates the 1992 and projected 2020 average daily traffic volumes.



LEVEL OF SERVICE - A

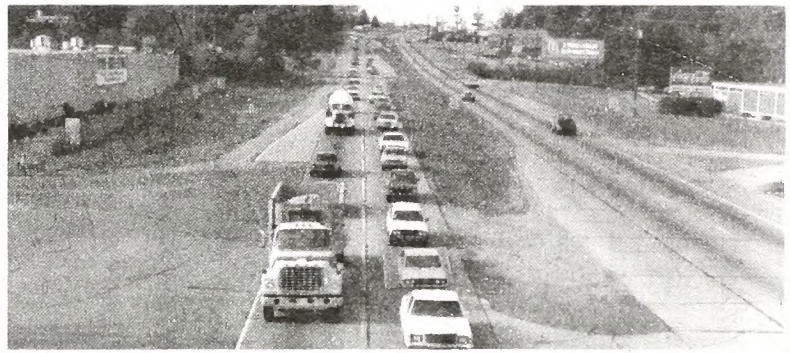


LEVEL OF SERVICE - B



LEVEL OF SERVICE - C

LEVEL OF SERVICE - D



LEVEL OF SERVICE - E

LEVEL OF SERVICE - F

FIGURE B-9

CURRENT AND PROJECTED AVERAGE DAILY TRAFFIC

LEGEND

Proposed Roadway

1992 ADT
2020 ADT

1992
2020

5,700
12,000

1,000
2,500

5,800

1,000
2,000

7,300
15,000

8,500
20,100

2,000

4,600
9,600

6,900
8,900

10,300
18,000

8,100
10,800

7,000
9,000

8,000
18,000

13,500

3,700
8,700

9,000
14,400

N

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0 1800 3600 5400

SCALE IN FEET

0 500 1000

SCALE IN METERS

FIGURE B-10

Raads At or Over Capacity in 2020 with US 64 Bypass Canstructed as Shown in TIP

LEGEND

Over Capacity

PROPOSED US 64

ROANOKE RIVER

BERTIE MARTIN COUNTY LINE

N

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0 1000 2000 3000

0 500 1000

Appendix C: COMPUTER MODEL DEVELOPMENT

Future travel demand was estimated with a combination of a "Sketch" and a "TRANPLAN" computer transportation model. The combined modeling process involved collecting rough socio-economic data based on a the requirements for a sketch model, and then analyzing the socio-economic data using the TRANPLAN software on a microcomputer. The combined modeling process uses three basic steps:

- collect socio-economic data,
- estimate through and external trips, and
- estimate internal trips.

Once the model accurately estimates the existing traffic patterns, socio-economic data projections were used in the computer model to estimate the 2020 traffic on the street network.

SOCIO-ECONOMIC DATA

Williamston is divided into 27 traffic analysis zones. The traffic analysis zones are based on 1990 Census block groups. Figure C-1 illustrates the Williamston zone map. Table C-1 lists the total dwelling units in each traffic analysis zone based on Census data and projections. Because 1990 Census Data on employment at the block level is not available to the general public, a surrogate "relative attractiveness factor" was used for employment. Table C-2 lists the "relative attractiveness factor" in each traffic-analysis zone.

Table C-1: WILLIAMSTON DWELLING UNITS

ZONE NUMBER	1990 DWELLING UNITS	2020 DWELLING UNITS
1	27	32
2	275	290
3	42	47
4	183	198
5	43	48
6	86	91
7	154	159

Table C-1: WILLIAMSTON DWELLING UNITS		
ZONE NUMBER	1990 DWELLING UNITS	2020 DWELLING UNITS
8	102	107
9	163	208
10	81	171
11	30	75
12	143	188
13	16	31
14	35	50
15	145	150
16	85	90
17	71	76
18	128	133
19	160	165
20	155	160
21	85	90
22	15	20
23	80	95
24	150	155
25	44	59
26	193	208
27	202	207

Table C-2: WILLIAMSTON RELATIVE ATTRACTIVENESS FACTORS		
ZONE NUMBER	1990 FACTOR	2020 FACTOR
1	100	112
2	100	112
3	100	112
4	100	112
5	100	112
6	200	212
7	10	22
8	10	22
9	500	540
10	550	630
11	500	540
12	80	120
13	164	176
14	164	176
15	50	55
16	97	109

Table C-2: WILLIAMSTON RELATIVE ATTRACTIVENESS FACTORS		
17	10	22
18	50	62
19	100	105
20	100	105
21	10	15
22	10	15
23	10	15
24	20	32
25	146	151
26	80	92
27	30	35

THROUGH and EXTERNAL TRIPS

Through trips were estimated using the procedures documented in Technical Report #3: Synthesized Through Trip Table For Small Urban Areas. Table C-3 lists the summary statistics for through and external trips.

Table C-3: THROUGH AND EXTERNAL TRIP SUMMARY							
LOCATION	(STA #)	1992	1992	1992	2020	2020	2020
		ADT	THRU	EXT	ADT	THRU	EXT
US 13/17	28	8500	6800	1700	20069	16072	3997
US 64	29	8000	4808	3192	20000	12000	8000
PROP US64	30	0	0	0	8050	4846	3204
DUMMY	31	0	0	0	0	0	0
US 13 (W)	32	7000	4280	2720	8033	5016	3017
SR 1409	33	1000	116	884	2000	230	1770
SR 1142	34	3700	690	3010	9441	1774	7667
DUMMY	35	0	0	0	0	0	0
DUMMY	36	0	0	0	0	0	0
US 17	37	9000	5490	3510	18900	11532	7368
SR 1420	38	1000	116	884	2500	290	2210
NC 125	39	5700	1708	3992	14250	4268	9982
TOTAL		43900	24008	19892	103243	56028	47215

INTERNAL TRIPS

Internal trips were generated and distributed using the gravity model. Table C-4 lists the trip generation rates for 1990 and 2020. Table C-5 lists the percentage of trips categorized by trip purpose. Table C-6 lists the regression equations used for trip attractions. The regression equations are based on "combined census employment categories" and associated employment trip attraction rates.

Table C-4: TRIP GENERATION RATES FOR 1990 AND 2020	
Excellent DU	9.5
Above Average DU	9.5
Average DU	9.5
Below Average	9.5
Poor	9.5

Table C-5: PERCENTAGE OF TRIPS CATEGORIZED BY PURPOSE	
Internal of total	85%
Home based work	33%
Other home based	33%
Non home based	34%

Table C-6: REGRESSION EQUATIONS
HOME-BASE-WORK PURPOSE:
Trip Attractions = 1.0*Relative Attractiveness Factor
OTHER-HOME-BASE PURPOSE:
Trip Attractions = 2.0* Relative Attractiveness Factor
NON-HOME-BASE PURPOSE
Trip Attractions = 2.0* Relative Attractiveness Factor
EXTERNAL-INTERNAL PURPOSE
Trip Attractions = 2.0* Relative Attractiveness Factor

PROJECTIONS

Socio-economic data projections are based on Williamston's population and land-use trends. Figures C-2 and C-3 illustrate "Williamston's Housing Projections" and "Williamston's Employment Projections" respectively. High, medium, and low growth areas for housing and employment were estimated subjectively based on discussions with local officials and Planning Board members.

FIGURE C-1
ZONE MAP
LEGEND
Planning Boundary
Zone Boundary
Zone Number 3
ROANOKE RIVER
WILLIAMSTON
AND VICINITY
MARTIN AND BERTIE COUNTIES
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U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
N

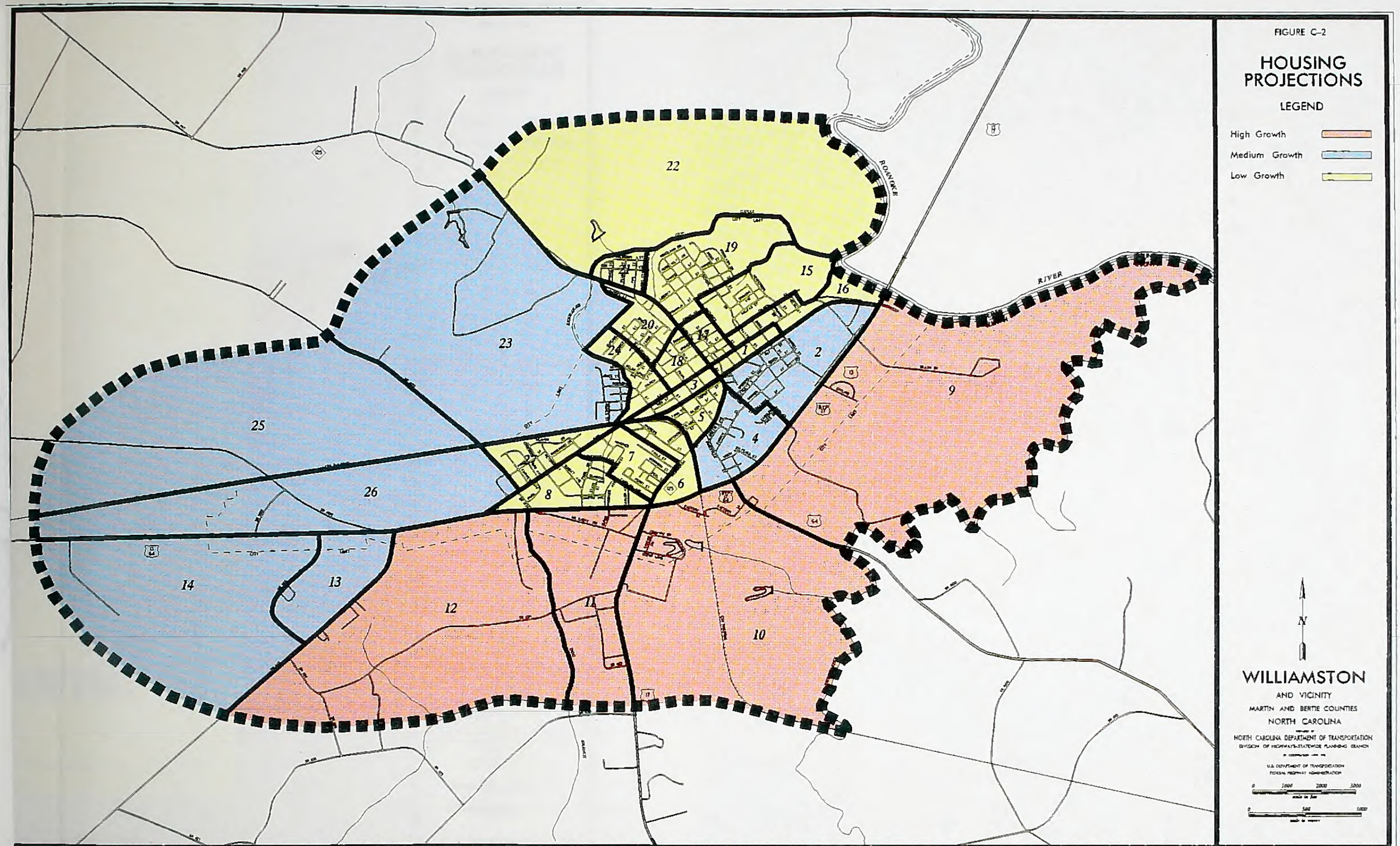
FIGURE C-2
HOUSING PROJECTIONS
LEGEND
High Growth
Medium Growth
Low Growth
WILLIAMSTON
AND VICINITY
MARTIN AND BERTIE COUNTIES
NORTH CAROLINA
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DIVISION OF HIGHWAYS-STATEWIDE PLANNING BRANCH
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
ROANOKE
RIVER
N
22
19
15
16
20
17
24
18
1
2
3
5
4
9
23
25
26
7
6
8
14
13
12
11
10

FIGURE C-3

EMPLOYMENT PROJECTIONS

LEGEND

- High Growth
- Medium Growth
- Low Growth

ROANOKE RIVER

N

WILLIAMSTON

AND VICINITY

MARTIN AND BERTIE COUNTIES

NORTH CAROLINA

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS-STATEWIDE PLANNING BRANCH

U.S. DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

Appendix D: ENVIRONMENTAL CONCERNS

During Williamston's thoroughfare planning process, there were several related items considered. Ecological and social environmental concerns such as wetlands, endangered species, and historic property were considered. In addition, alternative modes of transportation such as bicycles and railroads were also reviewed.

WETLANDS

Located in North Carolina's Coastal Plain, Williamston has a significant area classified as wetlands. Based on information in the National Wetlands Inventory, Figure D-1 illustrates the general areas classified a wetlands. During the Thoroughfare Planning Process, local officials did not propose any new roads in wetlands.

ENDANGERED SPECIES

Based on information recorded in the North Carolina Natural Heritage Program files as of January 1993, there are six plants and four animals which are threatened or endangered in Martin County. Although the roads proposed in Williamston's Thoroughfare Plan do not appear to cross any of the documented sites of these plants and animals, an environmental survey will necessary prior to selecting a specific roadway corridor.

HISTORIC PROPERTY

Based on information in the Archeology and Historic Preservation Section of the NC Department of Cultural Resources, there are two properties listed in the national historic register. Figure D-2 illustrates the locations of these areas. During the Thoroughfare Planning Process, local officials did not propose any new roads which would affect these historic structures.

BICYCLES

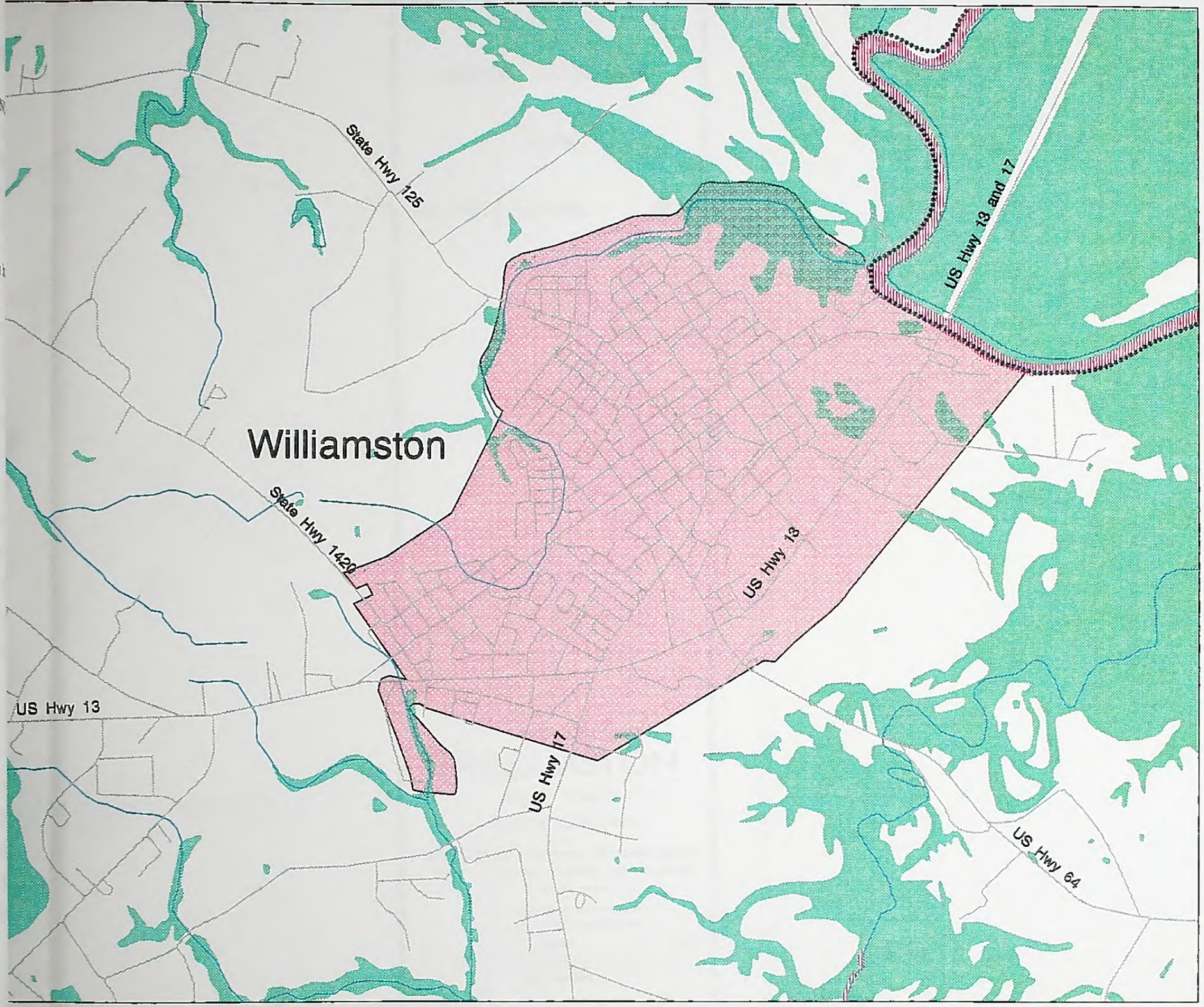
Based on information recorded in the North Carolina Department of Transportation Bicycle Program files as of February 1995, there are no existing NCDOT bicycle facilities in Williamston.

RAILROADS

Based on information recorded in the North Carolina Department of Transportation Railroad Program files as of February 1995, CSX Transportation has the only railroad in Williamston. Figure D-3 illustrates the location of this railroad.

Figure D-1

WILLIAMSTON AREA WETLANDS



Legend

- Roads (100K TIGER DATA)
- County Boundary (Statewide 100k)
- County Boundary
- State Boundary
- Shore Line
- 100k DEM Hyrography (Lines)
- Hydrography Line
- National Wetland Inventory (Eastern)
- E1 Estuarine
- E2 Estuarine
- L1 Lacustrine
- L2 Lacustrine
- M1 Marine
- M2 Marine
- P Palustrine
- R1 Riverine
- R2 Riverine
- R3 Riverine
- R4 Riverine
- R5 Riverine
- U URBAN
- Municipal Boundaries (Statewide)
- Municipal Boundaries

1200 0 1200 2400 Feet

360 0 360 720 Meters

FIGURE D-2

HISTORIC STRUCTURES

LEGEND

HISTORIC STRUCTURES

ASA BIGGS HOUSE

MARTIN COUNTY COURTHOUSE

N

DOWNTOWN
WILLIAMSTON
MARTIN COUNTY
NORTH CAROLINA

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IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

0 1000 2000
scale in feet

0 500
scale in meters

FIGURE D-3

RAILROADS

LEGEND

CSX Transportation

N

WILLIAMSTON

AND VICINITY

MARTIN AND BERTIE COUNTIES

NORTH CAROLINA

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FEDERAL HIGHWAY ADMINISTRATION

0 1000 2000 3000

SCALE IN FEET

0 500 1000

SCALE IN METERS

Appendix E: ROUTE INVENTORY

FACILITY & SECTION		EXISTING				CAPACITY	VOLUME			RECOMMENDED	
		R/W	SPEED	LANES	WIDTH	CURRENT	1991	%	2020	R/W	ROAD
		(m)	(kph)	(#)	(m)	(FUTURE)	ADT	TRUCK	ADT	(m)	TYPE
US 13											
WPAB	SR 1428	30	88.5	2	7.2	12,000	6492	3	9,000	ADQ	ADQ
SR 1428	SR 1142	30	88.5	2	7.2	12,000	6492	3	9,500	ADQ	ADQ
SR 1142	MAIN ST	30	72.4	2	11.0	12,000	6492	3	12,000	ADQ	ADQ
MAIN ST	WOODSIDE	52	72.4	4	14.4	24,000	14404	3	21,000	ADQ	ADQ
WOODSD AVE	US17	30	72.4	4	16.5	24,000	19000	2	23,000	ADQ	ADQ
US 17	US 64	30	72.4	4	14.4	24,000	11800	2	24,000	ADQ	ADQ
US 64	PROP US 13	30	88.5	4	14.4	24,000	11800	2	15,000	ADQ	ADQ
PROP US 13	US 17 BUS	30	88.5	4	14.4	24,000	11800	2	20,100	ADQ	ADQ
US 17 BUS	BERTIE CO	30	88.5	4	14.4	24,000	8380	2	20,100	ADQ	ADQ
US 13 PROPOSED											
WPAB	US 17	-	-	-	-	(24,000)	-	-	10,000	68.4	A
US 17	US 64	-	-	-	-	(24,000)	-	-	13,500	68.4	A
US 64	Exist. US 13	-	-	-	-	(24,000)	-	-	12,600	68.4	A
US 17											
SPAB	SCL WILSTN	46	88.5	4	14.4	24,000	8258	3	14,400	ADQ	ADQ
SCL WILSTN	US 13-64	46	72.4	4	14.4	24,000	11187	3	14,900	ADQ	ADQ
US 13-64	BERTIE CO	SEE US 13									
US 17 BUS											
US 13	SYCAMORE	18	56.3	4	13.4	20,000	9200	1	10,800	ADQ	ADQ

FACILITY & SECTION		EXISTING				CAPACITY	VOLUME			RECOMMENDED	
		R/W	SPEED	LANES	WIDTH	CURRENT	1991	%	2020	R/W	ROAD
		(m)	(kph)	(#)	(m)	(FUTURE)	ADT	TRUCK	ADT	(m)	TYPE
SYCAMORE	ELM STREET	18	56.3	4	13.4	20,000	9200	1	14,200	ADQ	ADQ
ELM STREET	R/R (NB)	18	56.3	2	9.1	13,000	4600	1	9,600	27	C
R/R	NC 125 (NB)	18	56.3	2	11.9	13,000	4600	2	9,600	27	C
NC 125	WATTS ST	18	32.2	2	14.4	12,000	1836	2	3,100	ADQ	ADQ
WATTS ST	BIGGS ST	-	56.3	2	12.5	12,000	1836	1	3,100	ADQ	ADQ
BIGGS ST	HENDRS ST	-	56.3	2	8.8	12,000	1836	1	3,100	ADQ	ADQ
HENDRS ST	US 13-17	18	56.3	2	9.1	12,000	1836	1	3,100	ADQ	ADQ
WASHINGTO	MAIN ST (SB)	-	56.3	2	11.0	13,000	5300	1	7,700	ADQ	ADQ
MAIN ST	NC 125 (SB)	-	32.2	2	14.0	13,000	9200	1	13,000	ADQ	ADQ
US 64											
PITT CO	SYCAMORE	SEE US 13									
SYCAMORE	ECL WILSTN	-	72.4	4	19.5	24,000	9797	3	18,000	ADQ	ADQ
ECL WILSTN	PROP US 13	30	88.5	4	14.4	24,000	5511	3	18,000	ADQ	ADQ
PROP US 13	EPAB	30	88.5	4	14.4	24,000	5511	3	18,000	ADQ	ADQ
NC 125											
US 13	MAIN ST	SEE US 17 BUS (N)									
MAIN ST	FRANKLN ST	18	56.3	2	10.7	12,000	6881	2	15,000	27	C
FRANKLN ST	LIBERTY ST	18	56.3	2	13.4	12,000	6881	2	15,000	27	C
LIBERTY ST	NCL WILSTN	18	56.3	2	13.4	12,000	5735	2	13,500	ADQ	ADQ
NCL WILSTN	NPAB	30	88.5	2	6.7	11,000	5735	2	12,000	ADQ	ADQ
NC 125 S											
WASHINGT ST	MAIN ST	SEE US 17 BUS (S)									

FACILITY & SECTION		EXISTING				CAPACITY	VOLUME			RECOMMENDED	
		R/W	SPEED	LANES	WIDTH	CURRENT	1991	%	2020	R/W	ROAD
		(m)	(kph)	(#)	(m)	(FUTURE)	ADT	TRUCK	ADT	(m)	TYPE
MAIN ST	HAUGHTON ST	SEE US 17 BUS (S)									
NC 125 BYP (PRO)											
NC 125 (Existing)	US 13	-	-	-	-	(12,000)	-	-	5,800	30	K
JAMESVILLE ST.											
US 13	WASHINGTON	18	56.3	2	-	(24,000)	7,900	-	18,000	27	C
MAIN STREET											
US 13	ELM STREET	-	56.3	2	-	12,000	8,000	-	8,900	ADQ	ADQ
RAILROAD ST											
MAIN STREET	HAUGHTON ST	-	-	-	-	(12,000)	-	-	2000	21	I
SR 1142											
SPAB	PROP US 13	-	88.5	2	6.4	11,000	3716	-	5,700	ADQ	ADQ
PROP US 13	US 13	-	88.5	2	6.4	11,000	3716	-	8,700	ADQ	ADQ
SR 1409											
WPAB	US 13	-	56.3	2	5.8	9,000	1273	-	2,000	ADQ	ADQ
SR 1420											
WPAB	US 13	-	56.3	2	-	12,000	1000	-	2,500	ADQ	ADQ

Appendix F: TYPICAL THOROUGHFARE CROSS SECTIONS

Cross section "A" illustrates a fully controlled access freeway. Rural Interstates typically have this cross section. The 3.6 meter lanes, wide median and wide shoulders provide maximum speed, efficiency, and safety for travelers.

Cross section "B", illustrates a seven-lane urban roadway. This cross section should only be limited to situations when right-of-way is severely restricted and additional capacity is needed on an existing five-lane roadway. When the conditions warrant six through lanes, cross section "E" is preferable.

Cross section "C" illustrates a five-lane urban roadway with four through lanes and a center turning lane. Turning vehicles crossing the main traffic flow create accident hazards and traffic friction.

Cross section "D" illustrates a six-lane divided highway with a raised median and partial control of access. The 4.8 meter (16') median is the minimum recommended for an urban boulevard type cross section. Medians may be landscaped in urban areas when municipalities assume responsibility for the regular landscaping maintenance.

Cross section "E" illustrates an urban four-lane highway with a raised median and partial control of access. The 4.8 meter (16') median is the minimum recommended for an urban boulevard type cross section. Medians may be landscaped in urban areas when municipalities assume responsibility for the regular landscaping maintenance.

Cross section "F" illustrates an urban four-lane divided highway with curb, gutter and partial control of access. This curb and gutter section only uses half of the right-of-way required by the shoulder section and still allows efficient and safe traffic flow.

Cross section "G" illustrates a four-lane roadway with no center lane for left turns. When traffic volumes are high, vehicles turning left into driveways block traffic in the through lane. Additional left turn lanes are typically necessary at major intersections.

Cross section "H" illustrates a three-lane roadway. For two-directional traffic flow, the center lane can be a turning lane. For one-way traffic flow, all three lanes flow in the same direction with a parallel road operating in the opposite direction.

Cross section "I" illustrates a two-lane road with parking on both sides. Because this facility serves both land use and traffic, it should be designated a minor thoroughfare or a local street.

Cross section "J" illustrates a two-lane road with parking on one side. Because this facility serves both land use and traffic, it should be designated a minor thoroughfare or a local street.

Cross section "K" illustrates a rural two-lane roadway with shoulders. When two lanes will have enough capacity through the design year, but may ultimately need additional capacity, 30 meters of right-of-way are recommended. This allows future local officials the ability to widen the road as much as necessary, up to a four-lane divided cross section with a raised median.

Cross section "L" illustrates a six-lane divided highway with a grass median and full control of access. The median is eight to nine meters wide.

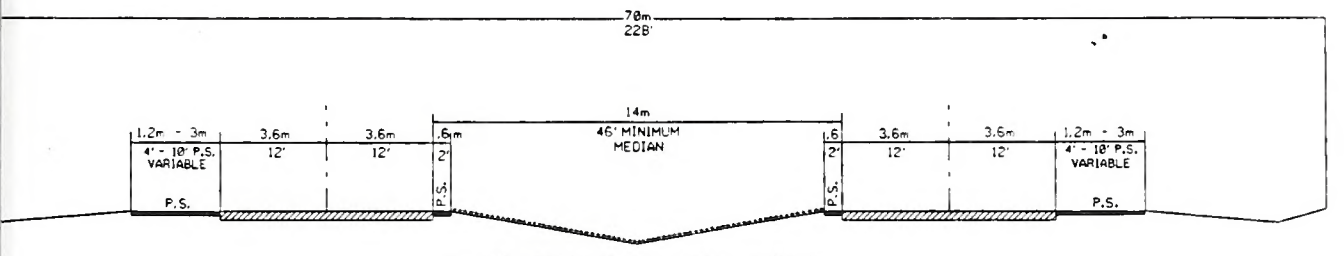
Cross section "M" illustrates an urban eight-lane divided highway with a raised median and partial control of access. Medians may be landscaped in urban areas when municipalities assume responsibility for the regular landscaping maintenance.

The curb and gutter urban cross sections illustrate the sidewalk between the road and the utility strip. The sidewalk width is the minimum recommended safety buffer between moving automobiles and utility poles. For additional pedestrian safety and community aesthetics, municipalities often place sidewalks outside of this buffer zone. Additional right-of-way is necessary if the sidewalk is moved farther away from the street.

Communities encouraging bicycling should allow additional right-of-way for the bicycle facilities. Cross sections N, O and P are typically used to accommodate bicycle travel. The Guide For Development of New Bicycle Facilities published by the American

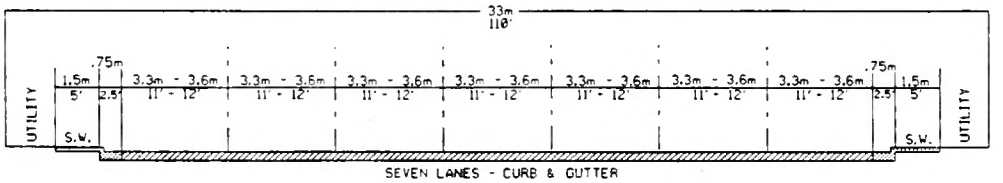
Association of State Highway and Transportation Officials details design standards for bicycle facilities.

TYPICAL THOROUGHFARE CROSS SECTIONS



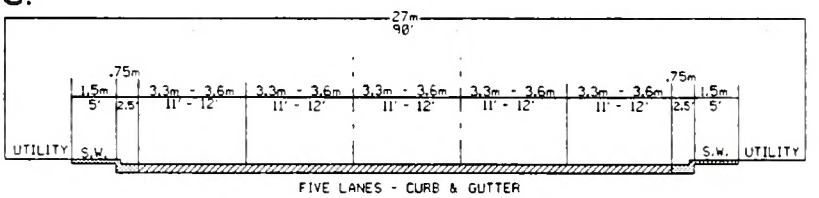
FOUR LANES DIVIDED WITH MEDIAN - FREEWAY

B.



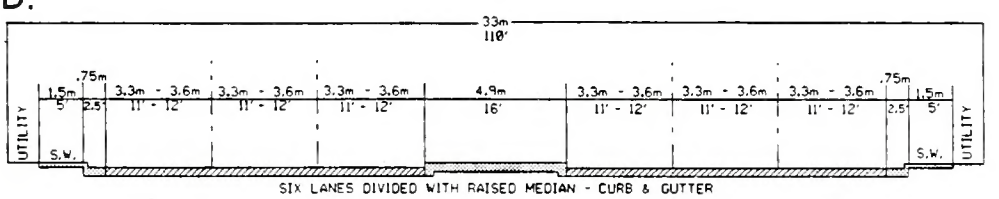
SEVEN LANES - CURB & GUTTER

C.



FIVE LANES - CURB & GUTTER

D.

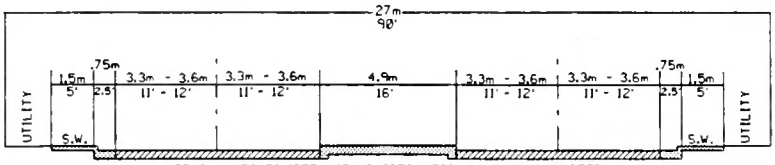


SIX LANES DIVIDED WITH RAISED MEDIAN - CURB & GUTTER

FIGURE F-1

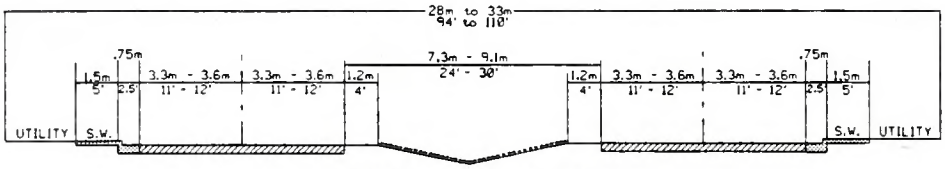
TYPICAL THOROUGHFARE CROSS SECTIONS

E.



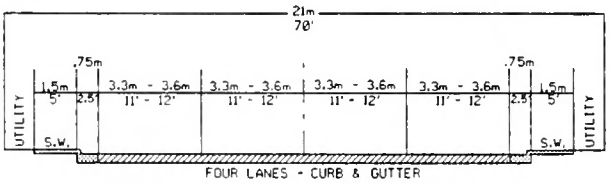
FOUR LANES DIVIDED WITH RAISED MEDIAN - CURB & GUTTER

F.



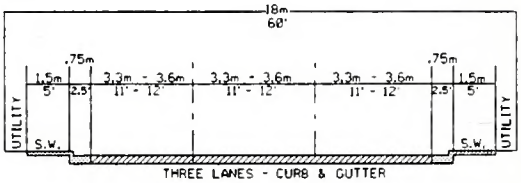
FOUR LANES DIVIDED - BOULEVARD
GRASS MEDIAN

G.



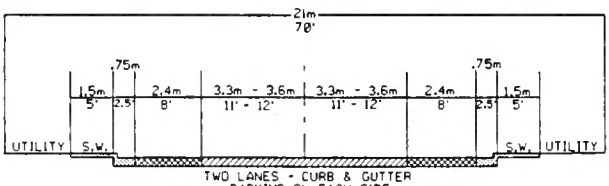
FOUR LANES - CURB & GUTTER

H.



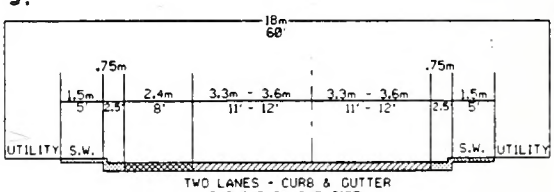
THREE LANES - CURB & GUTTER

I.



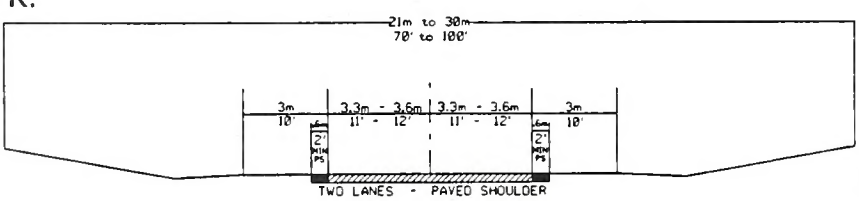
TWO LANES - CURB & GUTTER
PARKING ON EACH SIDE

J.



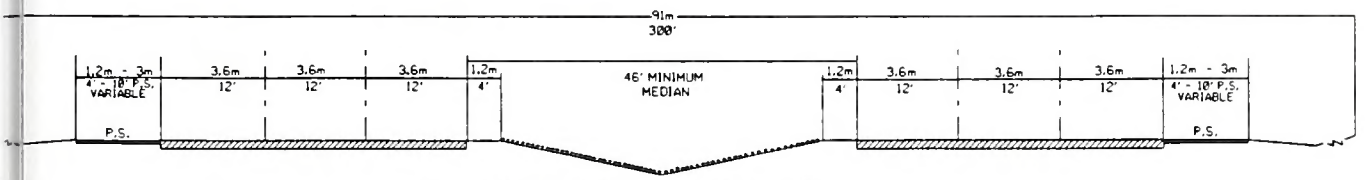
TWO LANES - CURB & GUTTER
PARKING ON ONE SIDE

K.



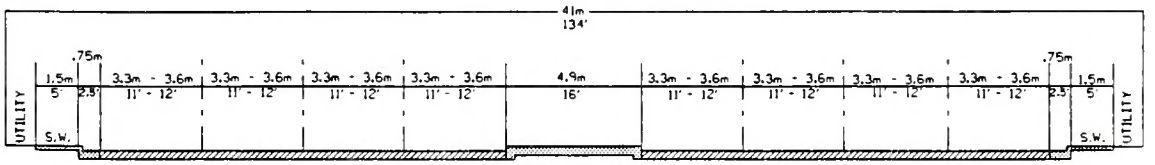
TWO LANES - PAVED SHOULDER

TYPICAL THOROUGHFARE CROSS SECTIONS



SIX LANES DIVIDED WITH GRASS MEDIAN - FREEWAY

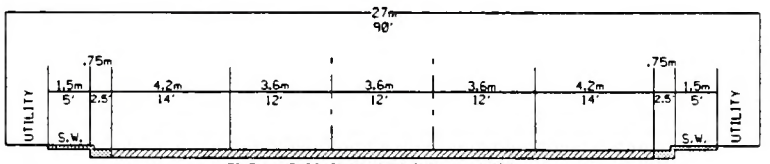
M.



EIGHT LANES DIVIDED WITH RAISED MEDIAN - CURB & GUTTER

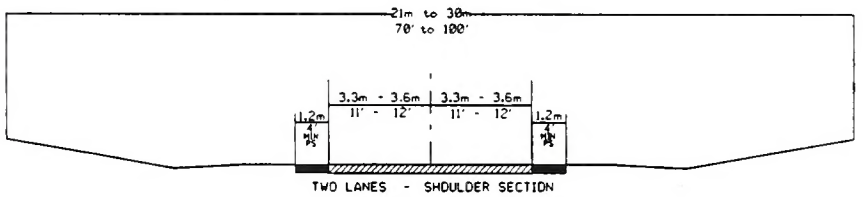
TYPICAL THOROUGHFARE CROSS SECTIONS FOR ACCOMMODATING BICYCLES

N.



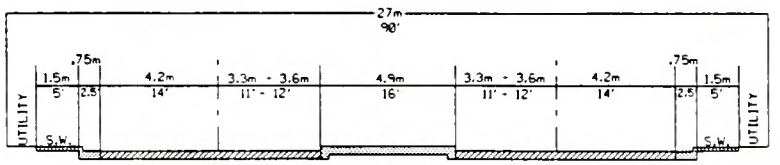
FIVE-LANE ROADWAY WITH CURB & GUTTER.
STANDARD INSIDE LANES & WIDENED CURB LANES

O.



TWO LANES - SHOULDER SECTION

P.



FOUR LANES DIVIDED WITH RAISED MEDIAN - CURB & GUTTER.
STANDARD INSIDE LANES & WIDENED CURB LANES

Appendix G: EXAMPLE SUBDIVISION ORDINANCES

DEFINITIONS

I. Streets and Roads:

A. *Rural Roads*

- Principal Arterial - a rural road serving statewide or interstate travel. Principal Arterial roads should serve high volumes of through traffic, not direct land access.
- Minor Arterial - a rural road serving intrastate and inter-county travel by connecting cities and towns. Minor Arterial roads should provide efficient traffic flow, but may have limited direct land access.
- Major Collector - a rural road serving major intra-county travel and large traffic generators. Major Collector roads should connect traffic to the Arterial roads.
- Minor Collector - a rural road serving local communities and moderate traffic generators. Minor Collector roads should provide both traffic movement and direct land access.
- Local Road - a rural road which provides direct access to adjacent land.

B. *Urban Streets*

- Major Thoroughfare - a major street which carries high volumes of traffic in and through urban areas. Major Thoroughfares primarily serve traffic movement, not direct land access.
- Minor Thoroughfare - a street which connects local streets to Major Thoroughfares. Minor Thoroughfares should serve both traffic movement and direct land access.
- Local Street - a street which provides direct access to adjacent land.

C. *Specific Streets (Rural or Urban)*

- Interstate Highway - a divided multilane highway designed to carry large volumes of high speed traffic through states. Interstate Highways must be accessed by interchanges because they do not provide any direct land access.
- Freeway - a divided multilane highway designed to carry large volumes of high speed traffic. Freeways must be accessed by interchanges because they do not provide any direct land access.
- Expressway - a divided multilane roadway designed to carry large volumes of high speed traffic. Expressways have either full or partial control of access and generally have grade separations at major intersections.
- Parkway - a roadway designed for non-commercial traffic. Parkways may have either full or partial control or access.
- Frontage Road - a road that is parallel to a partial or full access controlled facility. Frontage roads provide direct land access.
- Local Residential Street - a street less than one mile long that does not serve major traffic generators or collect traffic from more than 100 dwelling units. Local residential streets can be cul-de-sacs or circles.
- Alley - a narrow road used only for service vehicles accessing the back side of properties.
- Cul-de-sac - a short street having one end open to traffic and the other end a vehicular turnaround.

II. Property

- Building Setback Line - a line parallel to the street which specifies the minimum distance between the street right-of-way and buildings.
- Easement - a grant by the property owner limiting the land use on a specific piece of property. For example, the property owner can give or sell easement rights for a street across a particular section of the property.

- Lot - a portion of land which can be bought or sold. A lot may also be referred to as a plat, parcel, or tract.

III. Subdivision

- Subdivider - a person, firm, corporation or official agent who divides large lots into smaller lots.
- Subdivision - (1) All divisions of a tract of land into two or more lots or building sites for sale or development (2) All divisions of land involving the dedication of new streets or changes in existing streets.
- Dedication - Property given by the owner to another party. Official dedications are made and accepted in writing.
- Reservation - An agreement to keep property free from development for a period of time. Property reservations do not involve any transfer of property rights.

DESIGN STANDARDS

All roads shall be designed in accordance with the NC Department of Transportation design standards and American Association of State Highway and Transportation Officials' (AASHTO) policies. The design standards listed in this appendix are for general reference only. Please refer to the NC DOT Roadway Design Manual or to the AASHTO's A Policy on Geometric Design of Highways and Streets for more detailed information.

I. Right-of-way

Minimum right-of-way (ROW) for roads shall conform with the recommendations listed in the thoroughfare plan. When the thoroughfare plan does not specify a ROW, the following widths should be used:

Table G-1: MINIMUM RIGHT-OF-WAY	
Rural Roads	Min. ROW
Principle Arterial Freeway	105 meters
Other Principle Arterial	60 meters
Minor Arterial	30 meters
Major Collector	30 meters
Minor Collector	24 meters
Local Road	18 meters (1)
Urban Roads	Min. ROW
Major Thoroughfare other	27 meters
Minor Thoroughfare	21 meters
Local Street	18 meters (1)
Cul-de-sac	Variable (2)

(1) The minimum desirable ROW is 18 meters, but if curb and gutter is provided, 15 meters of ROW are adequate on local residential streets.

(2) The ROW dimension will depend on radius used for vehicular turnaround. The distance from the edge of the pavement of the turnaround to ROW should not be less than distance from edge of pavement to ROW on the street approaching turnaround.

Subdivisions should provide access to properties from local streets. Direct property access to major thoroughfares, principle arterials, minor arterials, and major collectors should be avoided.

When proposed subdivisions conflict with proposed thoroughfares, the subdivider shall dedicate the necessary ROW for the proposed thoroughfare. The subdivider will only be required to dedicate a maximum of 30 meters of ROW. In cases where over 30 meters of ROW are needed, the subdivider should dedicate 30 meters, and reserve the amount in excess of 30 meters.

When a proposed subdivision borders a proposed thoroughfare, and undeveloped land boarders the opposite side of the proposed thoroughfare, partial width ROW may be dedicated. However, the partial ROW must be at least eighteen meters, and the width of the partial dedication must be wide enough to construct necessary facilities to serve

abutting lots. Subsequently, when the undeveloped land on the opposite side of the road is subdivided, the remainder of the required ROW shall be dedicated.

When proposed subdivisions are adjacent to proposed thoroughfare widenings, subdividers shall dedicate the necessary ROW for the proposed thoroughfare widening.

II. Street Widths

Street widths should conform with the recommendations listed in the thoroughfare plan. When the thoroughfare plan does not specify a street width, the following widths should be used:

- Local residential streets with a curb and gutter should have 7.8 meters of pavement from face-to-face of the curb. Local residential streets with a shoulder should have six meters of pavement and 1.2 meter shoulders.
- Residential collector streets with a curb and gutter should have 10.2 meters from face-to-face of the curb. Residential collector streets with a shoulder should have six meters of pavement and 1.8 meter shoulders.

III. Geometric Characteristics

The standards outlined below shall apply to all subdivision streets proposed for addition to the State Highway System or Municipal Street System.

Minimum Design Speed

- The design speed should be a minimum of ten kilometers per hour greater than the posted speed limit. The design speeds for subdivision streets shall be:

Table G-2: DESIGN SPEEDS (kph)

Facility Type	Desirable	Minimum (Level)	Minimum (Rolling)
RURAL			
Minor Collector Roads	100	80	70
Local Roads Including Residential Collectors and Local Residential	80	80	70
URBAN			

Table G-2: DESIGN SPEEDS (kph)			
Facility Type	Desirable	Minimum (Level)	Minimum (Rolling)
Major Thoroughfares other than Freeway or Expressway	100	80	80
Minor Thoroughfares	100	80	70
Local Streets	70	70	50

Maximum and Minimum Grades

- The maximum grades in percent shall be:

Table G-3: MAXIMUM VERTICAL GRADE				
Facility Type	Design Speed (km/h)	Maximum Grade (%) Flat	Rolling	Mountain
RURAL Minor Collector Roads	30	7	10	12
	50	7	9	10
	60	7	8	10
	100	5	6	8
Local Roads including Residential Collectors and Local Residential Streets	30	-	11	16
	50	7	10	14
	60	7	9	12
	100	5	6	-
URBAN Major Thoroughfares other than Freeway or Expressway	50	8	9	11
	60	7	8	10
	100	5	6	8
Minor Thoroughfares	30	9	10	12
	50	9	9	10
	60	9	8	10
	100	6	6	8
Local Streets	30	-	12	17
	50	8	11	15
	60	8	10	13
	100	6	7	-

- Minimum grade should not be less than 0.5%.

- Grades for 30 meters each way from intersections (measured from edge of pavement) should not exceed 5%.
- For streets and roads with projected annual average daily traffic less than 250, short grades less than 150 meters long, may be 150% of the value in the above table.

Minimum Sight Distance

In the interest of public safety, no less than the minimum sight distance applicable shall be provided. Vertical curves that connect each change in grade shall be provided and calculated using the following parameters:

Table G-4: SIGHT DISTANCE

Design Speed (km/h)	30	50	60	90	100
Stopping Sight Distance					
Minimum (meters)	30	60	80	140	160
Desirable (meters)	30	70	90	170	210
Minimum K Value for:					
Crest curve	3	10	18	71	105
Sag curve	4	12	18	40	51

(1) K is a coefficient which the algebraic difference in grade is multiplied to determine the length of the vertical curve which will provide the desired sight distance. (General practice calls for vertical curves to be multiples of 10 meters.)

Maximum Superelevation

The superelevation table below shows the maximum radius and maximum superelevation for design speeds. The maximum rate of roadway superelevation (e) for rural roads with no curb and gutter of 0.08. The maximum rate of superelevation for urban streets with curb and gutter is 0.06.

Table G-5: SUPERELEVATION TABLE		
Design Speed (km/h)	Maximum e	Minimum Radius (meters)
50	0.04	100
60	0.04	150
90	0.04	375
100	0.04	490
50	0.06	90
60	0.06	135
90	0.06	335
100	0.06	435
50	0.08	80
60	0.08	125
90	0.08	305
100	0.08	395
e = rate of roadway superelevation, meter per meter		

IV. Intersections

- Streets shall intersect as nearly as possible at right angles. No street should intersect any other street at an angle less than sixty-five degrees.
- Property lines at intersections should be set so that the distance from the edge of pavement, of the street turnout, to the property line will be at least as great as the distance from the edge of pavement to the property line along the intersecting streets. This property line can be established as a radius or as a sight triangle. Greater offsets from the edge of pavement to the property lines will be required, if necessary, to provide sight distance for the stopped vehicle on the side street.
- Offset intersections should be avoided. Intersections which cannot be aligned should be separated by a minimum length of 60 meters between survey center lines.
- Intersections along major thoroughfares should be spaced at regular intervals. Five hundred meters is the minimum desirable spacing between intersections.

V. Cul-de-sacs

Cul-de-sacs shall not be more than 150 meters long.

VI. Alleys

Alleys shall be at least sixty meters wide. Dead-end alleys shall be avoided. However, if dead-end alleys are unavoidable, adequate turnaround facilities shall be provided at the dead-end.

VII. Driveways Connecting To State Roads

A permit from the Department of Transportation is required for connecting driveways to any state maintained road. Permit approval is required prior to any construction on the road. Driveway permit applications are available from the District Engineer's office.

VIII. Offsets To Utility Poles

On roadways with shoulders, utility poles should be located a minimum of nine meters from the edge of pavement. On streets with curb and gutter, utility poles should be a minimum of 1.8 meters behind the face of the curb.

IX. Wheel Chair Ramps

All street curbs being constructed or reconstructed for maintenance purposes, traffic operations, repairs, correction of utilities, or altered for any reason, shall provide wheelchair ramps for the physically handicapped at intersections where both curb and gutter and sidewalks are provided and at other major points of pedestrian flow.

X. Bridge Deck Width

The bridge deck widths for new bridges serving 2-lane, 2-way traffic should meet the following specifications:

1. *Shoulder section approach*

   - If the design year average daily traffic is under 800 vehicles per day, the bridge deck should be three meters wider than the roadway width or 8.4 meters, whichever is greater.
   - If the design year average daily traffic is between 800 and 2000 vehicles per day, the bridge deck should be 3.6 meters wider than the roadway width or 10.2 meters, whichever is greater.
   - If the design year average daily traffic is over 2000 vehicles per day, the desirable bridge deck is 13.2 meters. The minimum bridge deck width is 12 meters.

2. *Curb and gutter approach*

   - If the design year average daily traffic is under 800 vehicles per day, the bridge deck should be a minimum of 7.2 meters from face-to-face of curbs.
   - If the design year average daily traffic is over 800 vehicles per day, the bridge deck should be the width of the approach pavement from face-to-face of curbs.
   - Where curb and gutter sections are used on roadway approaches, curbs on bridges shall match the curbs on approaches in height and in crown drop.

The bridge deck widths for new bridges having four or more lanes serving undivided two-way traffic should meet the following specifications:

1. If the approaching roadway has a shoulder, the bridge deck should have the width of approach pavement plus width of usable shoulders on both sides.
2. If the approaching roadway has a curb and gutter, the bridge deck should have the width the of approach pavement measured from face-to-face of the curbs.

ENGLISH TO METRIC CONVERSION TABLE			
English Units		S.I. Units	
1 inch	equals	25.4 millimeters	(mm)
1 foot	equals	0.3 meters	(m)
1 mile	equals	1.6 kilometers	(km)
1 acre	equals	2.47 hectares	(hect)

Appendix H: DOT PEDESTRIAN POLICY GUIDELINES

(4-20-94)

EXECUTIVE SUMMARY

These guidelines provide a procedure for implementing the Pedestrian Policy adopted by the Board of Transportation in August 1993. The Pedestrian Policy addresses TIP projects and makes an important distinction between "considering the needs of pedestrians to avoid creating hazards to pedestrian movements" and the concept of "facilitating pedestrian movements for other reasons."

HAZARDS

A hazard in this context is defined as a situation when pedestrian movements are physically blocked in a manner which forces pedestrians to use another mode of transportation or walk in an automobile traffic lane (parallel with the automobile traffic) to pass a barrier. The concept of "not creating a hazard" is intended to allow municipalities to have the flexibility to add pedestrian facilities as part of the project, or in the future after the TIP project is complete. Our current standard cross sections generally do not create barriers for pedestrian movements. One exception is on urban bridges where the bridge rail is at the back of the curb.

QUANTIFYING THE NEED FOR PEDESTRIAN FACILITIES

Planning studies should evaluate the need for pedestrian facilities based on the degree to which the following criteria are met.

1. Local Pedestrian Policy
2. Local Government Commitment
3. Continuity and Integration
4. Location

5. Generators
6. Safety
7. Existing or Projected Pedestrian Traffic

REQUIREMENTS FOR DOT FUNDING

REPLACING EXISTING SIDEWALKS

The DOT will pay 100% of the cost to replace an existing sidewalk which is removed to make room for a widening project.

PREVENTING HAZARDS

If there is evidence that a TIP project would create a hazard to existing pedestrian movements, the DOT will take the initiative to not create the hazard. However, if there is not evidence that a TIP project would create a hazard to existing pedestrian movements, the municipality will need to prove there will be pedestrian movements which will be affected within five years by the hazard created by the TIP project.

INCIDENTAL PROJECTS

Due to the technical difficulty of describing justification for pedestrian facilities, the committee chose a cost sharing approach to provide cost containment for the pedestrian facilities. The DOT may share the incremental cost of constructing the pedestrian facilities if the "intent of the criteria" are met. The DOT will pay a matching share of incidental pedestrian facility total construction costs up to a cap of no more than 2% of total project construction cost. The matching share is a sliding scale based on population as follows:

MUNICIPAL POPULATION	PARTICIPATION	
	DOT	LOCAL
> 100,000	50%	50%
50,000 to 100,000	60%	40%
10,000 to 50,000	70%	30%
< 10,000	80%	20%

FUNDING CAPS

Under normal circumstances, the cumulative funding for preventing hazards and providing incidental pedestrian facilities should not exceed 2% of the total project construction cost.

INDEPENDENT PROJECTS

The DOT will have a separate category of money for all independent pedestrian facility projects in North Carolina. The independent pedestrian facility funds will be administered similar to the Bicycle Program.

RIGHT-OF-WAY

In general, municipalities are responsible for providing any right-of-way needed to construct pedestrian facilities. However, the 2.4 meter (8 foot) berm the DOT generally provides on urban curb and gutter facilities can accommodate pedestrian facilities.

MAINTENANCE

Local governments will be responsible for maintaining all pedestrian facilities.

PEDESTRIAN POLICY GUIDELINES

4-20-94

INTRODUCTION

These guidelines provide a procedure for implementing the Pedestrian Policy adopted by the Board of Transportation in August 1993. The Pedestrian Policy addresses TIP projects and makes an important distinction between "considering the needs of pedestrians to avoid creating hazards to pedestrian movements" and the concept of "facilitating pedestrian movements for other reasons." Consequently, these guidelines are divided into three main sections:

1) Considering the needs of pedestrians to avoid creating hazards.
2) Quantifying the need for pedestrian facilities.
3) Requirements for DOT funding.

CONSIDERING THE NEEDS OF PEDESTRIANS TO AVOID CREATING HAZARDS

Section "d" of the Pedestrian Policy states: "In the planning, design, and construction of TIP transportation projects, the DOT shall consider the needs of pedestrians and will not create hazards to pedestrian movements." This means that during each phase of a project, a DOT employee should consider how the project will affect pedestrian movements. If the project will create a hazard to pedestrian movement, the DOT should use engineering judgment and find a way to remove the hazard. A hazard in this context is defined as a situation when pedestrian movements are physically blocked in a manner which forces pedestrians to use another mode of transportation, or walk in an automobile traffic lane (parallel with the automobile traffic) to pass a barrier.

This does not mean that the DOT should build pedestrian facilities on all TIP projects. However, it does mean that the DOT should consider how projects will affect pedestrians and how projects can be designed to accommodate vehicular demands without

creating barriers to pedestrians. Hazards can be divided into two categories, lateral barriers and perpendicular barriers. Lateral barriers prevent pedestrians from traveling parallel to the roadway. Perpendicular barriers prevent pedestrians from crossing a roadway.

The concept of "not creating a hazard" is intended to allow municipalities to have the flexibility to add pedestrian facilities as part of the project or in the future after the TIP project is complete. Because bridges are so expensive and because they often have useful lives over fifty years, bridges should be given special consideration when pedestrian travel is anticipated.

BRIDGES

Current standard cross sections generally do not create barriers for pedestrian movements. One exception is on urban bridges where the bridge rail is at the back of the curb. A bridge which has barrier rail or support columns at the back of the curb and gutter is a lateral barrier. On rural bridges, a minimum shoulder may be sufficient to "not create a hazard for pedestrian movements" over or under the bridge.

SHOULDER CROSS SECTIONS

Currently, there is no typical cross section for a rural road with a shoulder, and a pedestrian facility which is outside of the ditch. However, when a rural road with a shoulder section has a pedestrian facility outside of the ditch, the ditch will not be considered a perpendicular barrier. Similarly, as long as there is some space where pedestrians can walk which is not in an automobile travel lane, the ditch will not be considered a lateral barrier either.

WIDENING PROJECTS

If a TIP project widens a road from 2 lanes to 5 lanes, the new 5-lane road is not considered a perpendicular barrier. Similarly, as long as there is some space where pedestrians can walk which is not in an automobile travel lane, the new 5-lane road is not considered a lateral barrier either.

RELOCATING PEDESTRIAN MOVEMENTS

This policy is not intended to require a pedestrian bridge or tunnel at interchanges where sidewalks and crosswalks are not practical. In these cases, the DOT may consider relocating the pedestrian movement to avoid creating unsafe situations or making unpractical design modifications. Typically, relocated pedestrian movements should be no more than 800 meters (0.5 miles) away from the original path of the pedestrians. The 800 meter distance is a one way distance, not a round trip distance.

CONSTRUCTION PROCESS

During the construction phase of a project, there may be times when it is not possible to maintain all pedestrian movements through the entire construction process. When necessary, there may be temporary barriers to pedestrian movements in the work zone.

EXAMPLE

For example, the "XYZ" Expressway is a new controlled-access freeway through an established urban area. A major thoroughfare with sidewalks which will have a new interchange with the Expressway, connects a neighborhood on the north side of the Expressway with a hospital on the south side of the Expressway. Because the proposed interchange for the major thoroughfare is a Single-Point-Diamond design with free-flowing ramps in all four quadrants, there is no safe way for a pedestrian to cross the Expressway with out conflicting with free-flowing traffic. Although there is a nearby railroad bridge over the Expressway, pedestrians are prohibited from that bridge because it was not designed to accommodate both trains and pedestrians. Consequently, residents who live in a neighborhood a few blocks from the hospital will now need to drive to the hospital or walk through a free-flowing traffic lane.

Using this example with the new pedestrian policy in effect, the design engineer should make every reasonable effort to design this interchange to accommodate the automobile traffic, and not create a barrier for pedestrian movements. If the interchange

design requires free-flow ramps as this Single-Point-Diamond design does, the engineer should determine if it is possible for pedestrians to cross the free-flow traffic lanes. If the peak hour traffic flow has acceptable gaps to allow pedestrians to cross safely, the ramps will not be considered a barrier. However, if traffic volumes or pedestrian volumes are too great, an alternative pedestrian facility should be considered. If accommodating pedestrians at the interchange will compromise safety or good engineering judgment, the engineer should consider if shifting the pedestrian movement away from the interchange is a feasible alternative. Since there is a nearby railroad bridge over the Expressway, maybe the railroad bridge could be designed to handle pedestrian movements too.

QUANTIFYING THE NEED FOR PEDESTRIAN FACILITIES

Section "e" of the Pedestrian Policy states: "The Department recognizes there are certain situations in which pedestrian facilities provide significant benefits in the movement of pedestrian traffic..." If a municipality would like the DOT to consider a project for "significant benefits," the municipality is responsible for collecting any necessary information and submitting a written request prior to the initiation of a planning study. The DOT will review the request and, if necessary, verify the data from the municipality. If pedestrian facilities are not incorporated into a project during the planning phase, and if there are significant factors which change during the time between the project planning study and the project design phase, municipalities may resubmit a request for pedestrian facilities prior to the closure of comment period for the Design Public Hearing.

Planning studies should evaluate the need for pedestrian facilities based on the degree to which the following seven criteria are met. Municipalities should address each of these criteria when submitting requests for pedestrian facilities. Subsequently, the DOT will make the final determination for pedestrian facility eligibility.

1. Local Pedestrian Policy. There is evidence that local policies on urban development are encouraging urban densities and residential developments to occur in a manner to facilitate pedestrian travel by reducing walking distances, and requiring sidewalk construction in development ordinances.

- Is a pedestrian plan included in local thoroughfare plan?
- Do subdivision ordinances require pedestrian facility construction?
- Do local zoning ordinances facilitate pedestrian travel?

  (For example, do the zoning ordinances encourage mixed-use developments which are accessible to pedestrians or do the zoning ordinances encourage highway strip development which is not accessible to pedestrians?)

2. Local Government or Local Sponsor Commitment. There is a local government/sponsor plan and commitment to provide an integrated system of pedestrian facilities which will connect with pedestrian facilities provided by the project.
   - Does the local Capital Improvement Program include local funds for providing pedestrian facilities which will connect with pedestrian facilities provided by the NC TIP project?
   - How many pedestrian facilities currently connect with the pedestrian facilities provided by the project?
   - How many subdivisions have provided pedestrian facilities which are or will be connected with pedestrian facilities provided by the project?
   - Has a responsible local government agency agreed in writing to maintain the pedestrian facility?
3. Continuity and Integration. The project provides a connection to an existing or a proposed pedestrian network and will provide a critical link in the network.
   - Is the project a critical link in an existing network?

     (For example, will this project provide a missing link in an existing network where there are pedestrian facilities extending beyond the length of this project?)

   - Is the project a critical link in a proposed network?

     (For example, will this project provide any link in a proposed network where there will be pedestrian facilities extending beyond the length of this project?)

4. Location. The project is located within a Census defined urban area or growth area where development is anticipated in the immediate future; a majority of the properties within walking distance of the project are developed, or projected to be developed

within 5 years at urban type residential densities. This five year period will begin at the completion of the appropriate environmental document.

- Is the project located in a Census defined urban area?
- Is the project located in a growth area (Urbanized Area Boundary) where development is anticipated in the immediate future, but is not in a Census defined urban area?
- Are a majority of the properties within walking distance of the project developed, or projected to be developed within 5 years at urban type residential densities (a minimum of 1 dwelling unit per acre)?

5. Generators. The project serves as a primary access from one or more of the following to one another:
   - day care, elementary or secondary school
   - college or university
   - community facility (such as library or park)
   - public transportation
   - commercial, office, industry, or business centers
   - residential areas
   - Will any of these land-uses within two kilometers (1.2 miles) of the project use this project as a primary access?
6. Safety. The project provides demonstrable safety benefits for pedestrians.
   - Will the pedestrian facility separate pedestrians from automobile traffic with a posted speed greater than 80 kilometers per hour (50 miles per hour)?
   - Will the pedestrian facility be used by children (0-14), elderly (65+), handicapped, or low-income people?
   - Will the pedestrian facility reduce potential pedestrian-vehicle conflicts?
   - Will the pedestrian facility address the identified safety needs of the area?
7. Existing or Projected Traffic. Continued, sustained pedestrian travel can be shown by any of the following:
   - Evidence of existing usage such as well worn paths.

- Projected usage based on previous experience with similar facilities.
- Minimum of 150 pedestrians per 24 hour period along a corridor planned for the project.

REQUIREMENTS FOR DOT FUNDING

REPLACING EXISTING SIDEWALKS

Section "b" of the Pedestrian Policy states: "When a highway construction project having to do with the widening of an existing street requires that an existing sidewalk be torn up to make room for the widening, it is the policy of the Department of Transportation to replace the sidewalk." This statement says the DOT will pay 100% of the cost to replace an existing sidewalk which is removed to make room for a widening project. There is no monetary cap for this category of funding pedestrian facilities.

PREVENTING HAZARDS

Section "d" of the Pedestrian Policy states: "In the planning, design, and construction of TIP transportation projects, the DOT shall consider the needs of pedestrians and will not create hazards to pedestrian movements." If there is evidence that a TIP project would create a hazard to existing pedestrian movements, the DOT will take the initiative to not create the hazard. However, if there is not evidence that a TIP project would create a hazard to existing pedestrian movements, the municipality will need to prove there will be pedestrian movements which will be affected within five years by the hazard created by the TIP project. The five year period will begin at the completion of the appropriate environmental document (Categorical Exclusion, Finding of No Significant Impact, or Environmental Impact Statement).

CERTAIN SITUATIONS

Section "e" of the Pedestrian Policy states: "The Department recognizes there are certain situations in which pedestrian facilities provide significant benefits in the movement of pedestrian traffic. The Department of Transportation may participate in the provision

of these facilities on a full or shared-cost basis." This statement says the DOT may participate in funding incidental projects, and independent projects as described below.

INCIDENTAL PROJECTS

Incidental pedestrian projects are defined as TIP projects where pedestrian facilities are included as part of the project. The DOT may share the incremental cost of constructing the pedestrian facilities if the "intent of the criteria" are met, and the request for DOT participation is made prior to the closure of comment period for the Design Public Hearing. The DOT will pay a matching share of incidental pedestrian facility total construction costs up to a cap of no more than 2% of total project construction cost. This "total project construction cost" does not include the construction cost of any incidental pedestrian facilities. The matching share is a sliding scale based on population as follows:

MUNICIPAL POPULATION	PARTICIPATION	
	DOT	LOCAL
> 100,000	50%	50%
50,000 to 100,000	60%	40%
10,000 to 50,000	70%	30%
< 10,000	80%	20%

The local government share of the pedestrian facility construction funding may not be Federal or State money for the purposes of these guidelines. In addition, the right-of-way municipalities provide for pedestrian projects may not be counted toward the required local contribution.

INDEPENDENT PROJECTS

Independent pedestrian projects are defined as projects where pedestrian facilities are the entire project. The DOT will have a separate category of money for all independent pedestrian facility projects in North Carolina. The independent pedestrian facility funds will be administered similar to Bicycle Program. Municipalities will prioritize their requests under the enhancements section of the local request list, and the DOT will fund as many projects as funding will allow.

GENERAL INFORMATION

The attached flow chart illustrates the decision process for a project engineer. In addition, the funding caps, right-of-way and maintenance requirements described below must also be met.

FUNDING CAPS

Under normal circumstances, the cumulative funding for preventing hazards and providing incidental pedestrian facilities should not exceed 2% of the total project construction cost. This "total project construction cost" does not include the construction cost of any incidental pedestrian facilities. The 2% cap is intended as a guide, not as an absolute cap. Consequently, the appropriate Branch Manager can approve pedestrian funds over the 2% cap.

RIGHT-OF-WAY

In general, municipalities are responsible for providing any right-of-way needed to construct pedestrian facilities. The DOT will allow pedestrian facilities on DOT right-of-way only if the pedestrian facility will not compromise the safety of vehicles or pedestrians. For preventing hazards, the DOT may buy the necessary right-of-way. For incidental and independent projects the DOT shall not pay extra right-of-way cost for pedestrian facilities.

Since the DOT's typical curb and gutter cross-section generally has a 2.4 meter (8 foot) berm, a 1.5 meter (5 foot) pedestrian facility may fit within this standard right-of-way. However, on curb and gutter sections, most municipalities want a 3 meter (10 foot) berm to put a 1.5 meter (5 foot) grassy strip and a 1.5 meter (5 foot) pedestrian facility. In this situation, the municipalities will need to provide the additional 0.6 meters (2 feet) of right-of-way.

On shoulder cross sections, the DOT typically does not have additional right-of-way behind the ditch. In addition, the DOT does not put paved pedestrian facilities between the road and the ditch. Since the DOT would not typically have the right-of-way

needed for a pedestrian facility, the municipality must provide all of the additional right-of-way.

Applicable AASHTO standards for right-of-way and design must be met. The DOT will not narrow automobile travel lanes to accommodate incidental pedestrian facilities. For example, if a project specifies five 3.6 meter (12 foot) lanes on a section of road, the DOT will not reduce the width of the travel lanes to 3.0 meters (10 feet) to create room for pedestrian facilities. In addition, if right-of-way is restricted, and there is insufficient room for pedestrian facilities and a utility strip, the utility strip will take precedence.

Applicable Federal and State regulations must also be met. For example, if right-of-way for a particular project is restricted by historic property, federal regulations on historic preservation may prohibit the DOT from using additional right-of-way for pedestrian facilities.

MAINTENANCE

Local governments are responsible for maintaining all pedestrian facilities. The Municipal Agreement will formally specify that the DOT is not responsible for maintaining pedestrian facilities.

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